

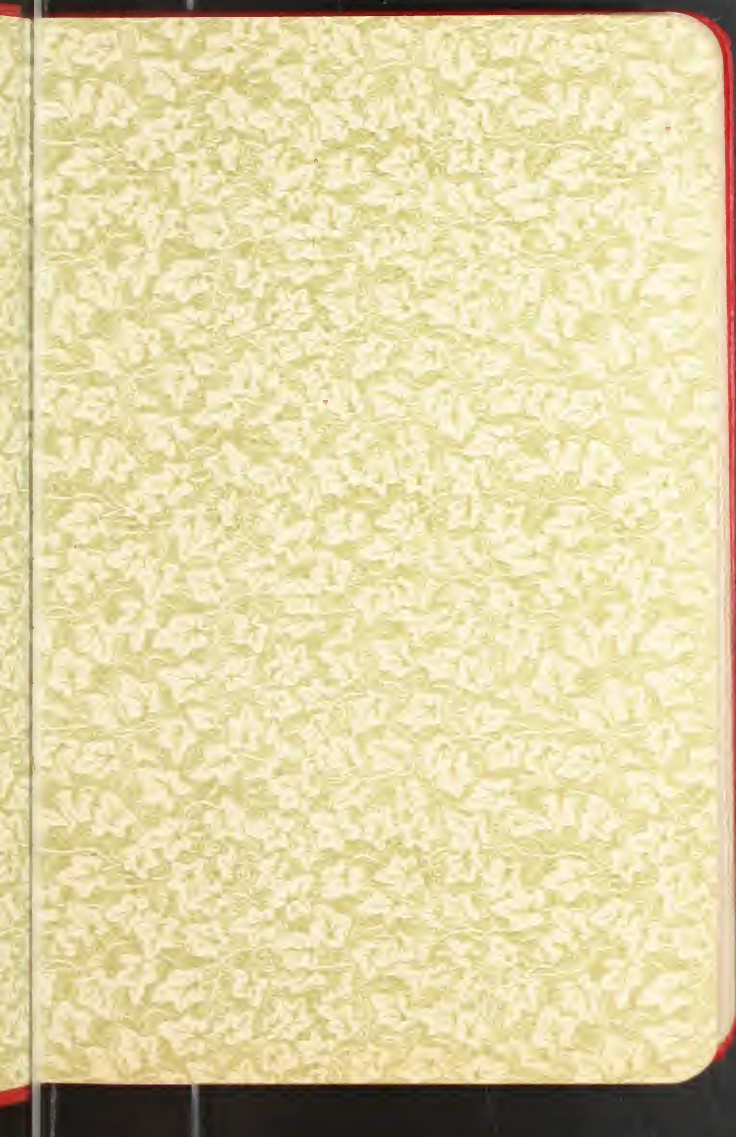
DORMAN, LONG & Co. Ltd.

MIDDLESBROUGH

ENGLAND

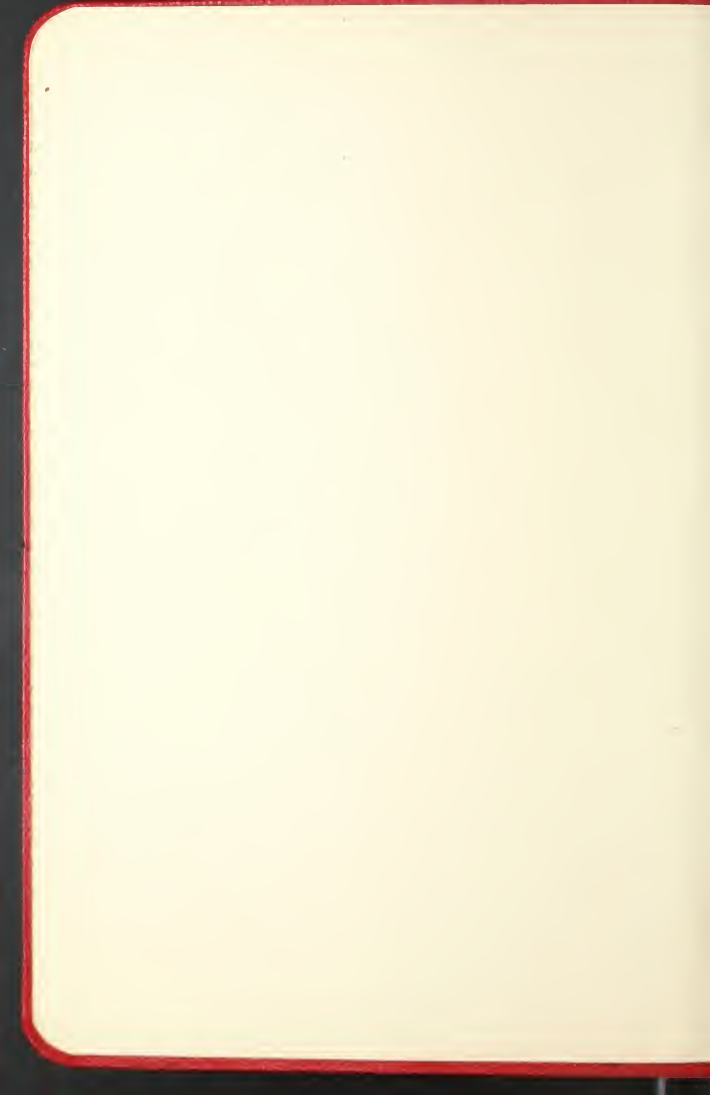
1906











POCKET COMPANION

CONTAINING

USEFUL INFORMATION & TABLES

PREPARED BY

THE I.R.C. CO.

STEEL

MANUFACTURED BY

DORMAN, LONG & Co.

LIMITED

MIDDLESBROUGH, ENGLAND

REVISED AND EDITED BY

THE COMMERCIAL DEVELOPMENT

FOR THE USE OF ENGINEERS, ARCHITECTS
AND BUILDERS.

1908

THE
JOURNAL OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE
OF GREAT BRITAIN AND IRELAND
PART I.

DORMAN, LONG & CO. LIMITED

REGISTERED OFFICE OF THE COMPANY
MIDDLESBROUGH.

TELEGRAPHIC ADDRESS: "DORMAN MIDDLESBROUGH"

Head Office and all Departments use the following codes:

LONDON TELEGRAPHIC CODE

WESTERN UNION TELEGRAPHIC CODE

A.B.C. TELEGRAPHIC CODE, 185-1870

A.L. TELEGRAPHIC CODE

BEYOND STANDARD SECTION CODE

Britania Steel Works and Rolling Mills, Middlesbrough.

Telegraphic Address: "Dormans, Middlesbrough."

Constructional Department, Middlesbrough.

Telegraphic Address: "Dormans, Middlesbrough."

Clarence Steel Works, Port Clarence, Middlesbrough.

Telegraphic Address: "Dormans, Port Clarence."

Cleveland Wire Works, Middlesbrough.

Telegraphic Address: "Dormans, Middlesbrough."

Sheet Works, Middlesbrough.

Telegraphic Address: "Dormans, Middlesbrough."

DORMAN, LONG & CO, LIMITED.

BRANCH OFFICES, WORKS AND STOCKYARDS

AT THE FOLLOWING PLACES.

LONDON. Office : 19 Victoria Street, S.W.

Telegrams : "PULISM, LONDON."

Stockyard and Shops : Nine Elms Lane, S.W.

Sheet Dept. | Office : 22 Leadenhall Street, E.C.

Wire Dept. | Telegrams : "TEEHLER, LONDON."

MANCHESTER. Office : 42 Deansgate.

Telegrams : "ACTVO, MANCHESTER."

NEWCASTLE. Office : 10 Neville Street.

Telegrams : "ECHALAT, NEWCASTLE."

GLASGOW. Office : Gordon Chambers, 90 Mitchell Street.

Telegrams : "BEAM, GLASGOW."

AUSTRALIA. Works & Stockyard : Grant St., South Melbourne.

Telegrams : "GIRTERS, MELBOURNE."

SOUTH AFRICA-

CAPE TOWN. Office : 7 & 8 Parker's Buildings, corner of Burg
and Strand Streets.

P.O. Box 1268. Telegrams : "STRUCTURAL, CAPE TOWN."

JOHANNESBURG. Office : Leake's Buildings, 5 Harrison Street.

P.O. Box 4642. Telegrams : "JOISTS, JOHANNESBURG."

PROPERTIES OF THE COMPANY

BRITANNIA STEEL WORKS BRITANNIA ROLLING MILLS

Basic Open Hearth Steel. Mallet Section of 42
comprising the Engineering, Shipbuilding, General
Constructional Work and Allied Trades.

PAGES 1 TO 32

CONSTRUCTIONAL & BRIDGE SHOPS

Steel Frame Buildings, Workshops, Bridges, etc.

PAGES 33 TO 145

SHEET DEPARTMENT

Rolling Mills with Galvanizing and Coating
Shops. Steel and Iron Sheet, Coated, Corrugated
and Plate. Complete fittings of all description.

PAGES 151 TO 163

WIRE & ROD DEPARTMENT

Rolling Mills, Wire-drawing and Galvanizing Shops.

PAGES 165 TO 173

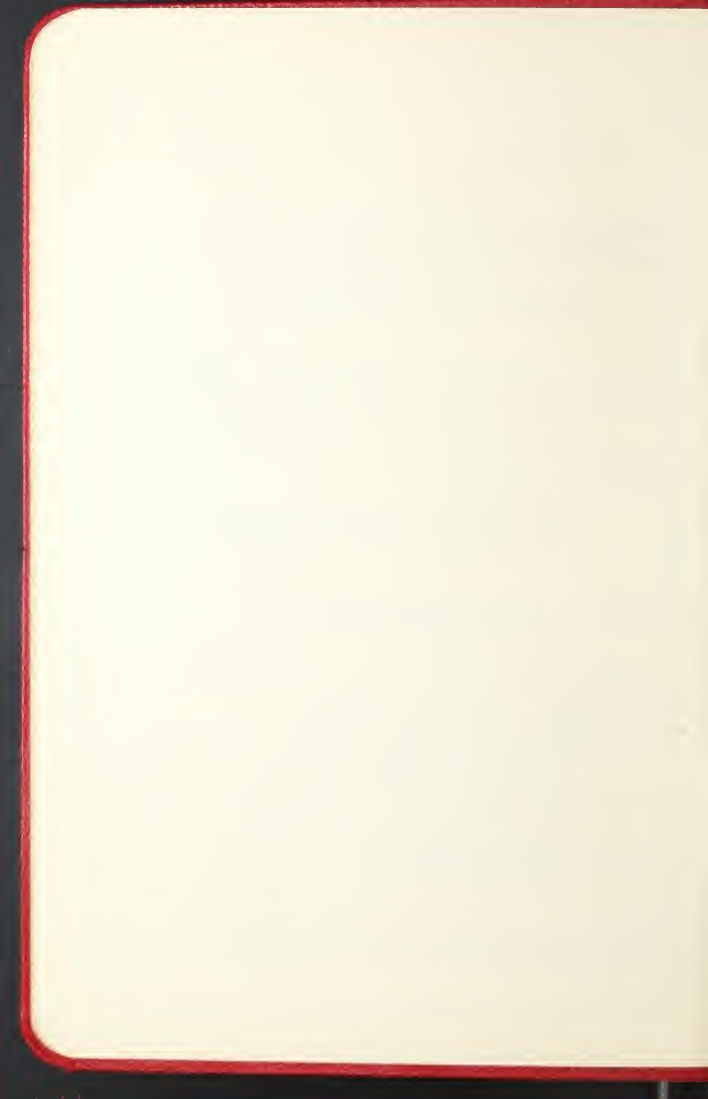
CLARENCE STEEL WORKS CLARENCE ROLLING MILLS

Open Hearth Steel. Mallet Section R.E.L. Mill.
Rolls, Tin Plate, Sheet and Plate.
Heavy standard sections and Specifications.
Constructive Steel in round, square, flat, other
shape, tubes and British Standard Tens.
A Specialty: Steel up to 12 Carbons for Wire Ropes,
Springs, Pipes, Tanks, etc.
Complete Sheet up to 24 inch, inch and 1/2 inch.

PAGES 175 TO 178

GENERAL INFORMATION, FORMULAE, TABLES, ETC. ETC.

PAGES 179 TO 252



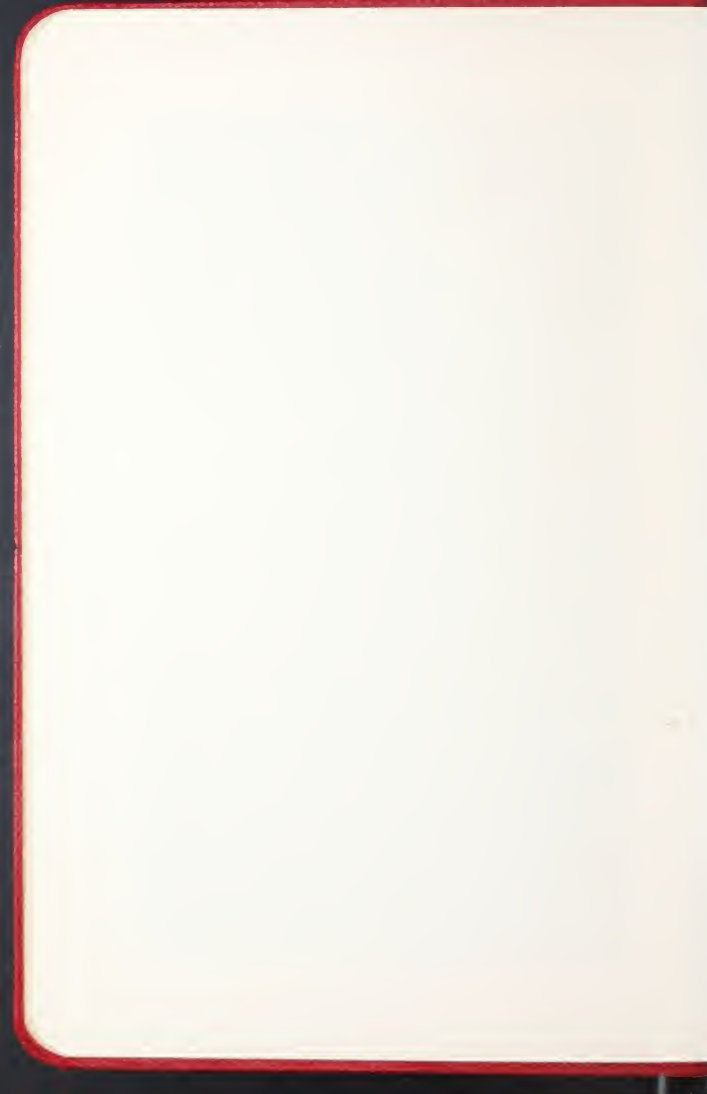


BRITISH STEEL WORKS





BRITANNIA STEEL FURNACES - LAY MIXER FOR MOLTEN IRON





BRITANIA ROLLING MILLS NO. 1 MILL

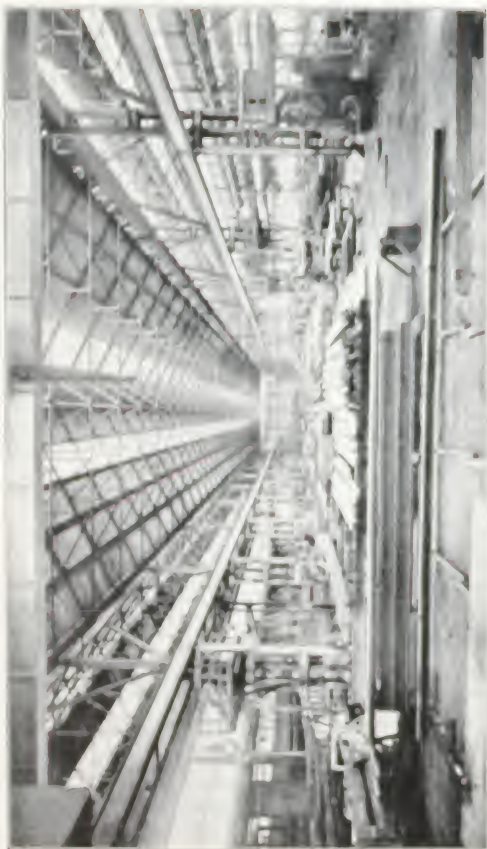




BRITANNIA ROLLING MILLS NO. 2 MILL

BRITANNIA ROLLING MILLS NO. 2 MILL





CONSTRUCTIONAL DEPARTMENT BRIDGE AND CEDER SWAY, NO. 8 RAY





CONSTRUCTION, SHIPYARD (1941) - Great and wide open hall in ship





ELECTRIC TRAMWAY CAR SHED
SUPPLIES ARE SHIPPED BY RAIL AND TRUCK

Copyright 1938 by the U.S. Government





STEEL FRAME BUILDING
 BIRMINGHAM AND JACKSON AT W. L. & CO. CO.

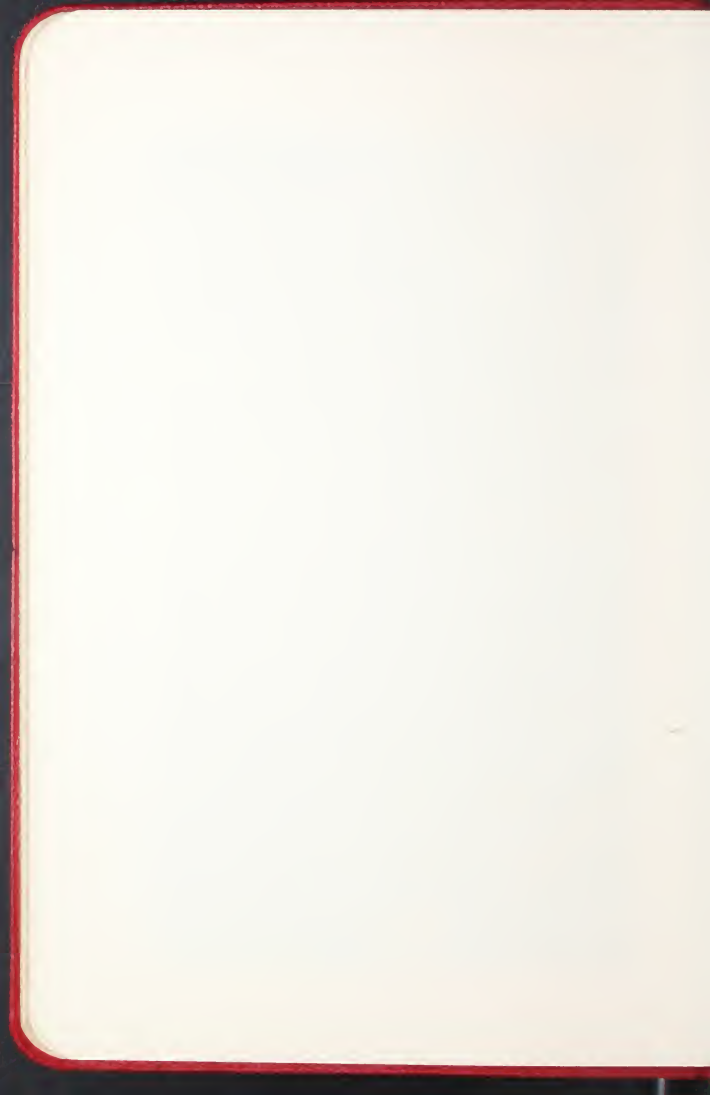




BRIDGE OF 200 FEET SPAN

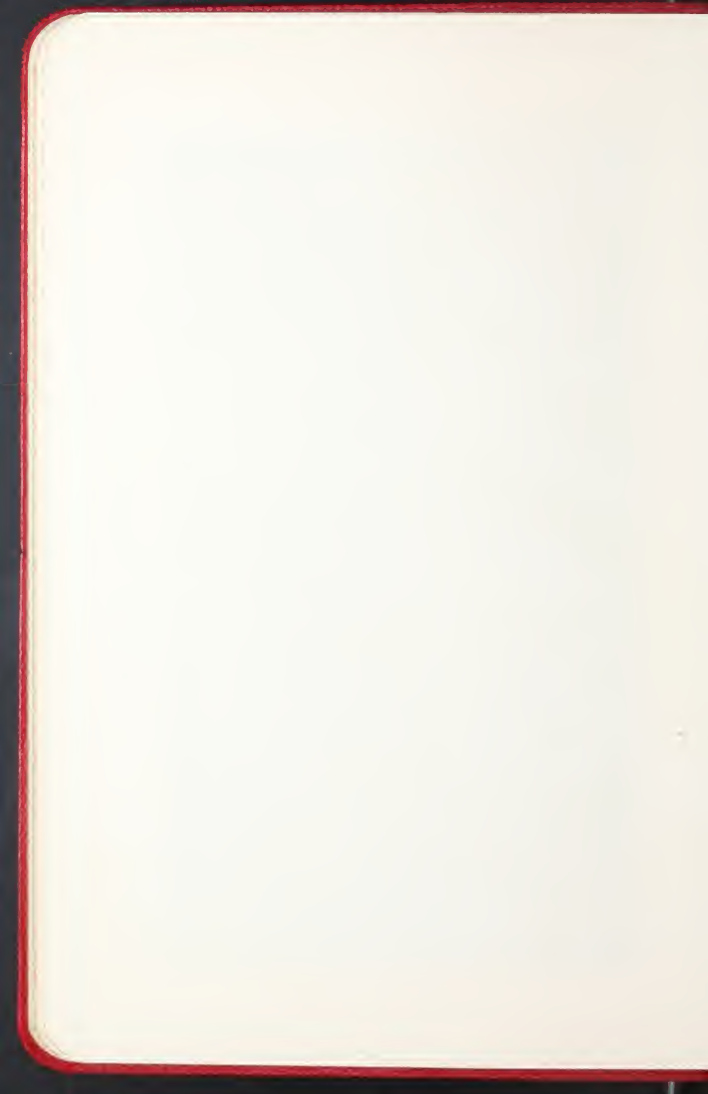
POINT OF VIEW

BRIDGE OF 200 FEET SPAN





CLARKE STEEL FURNACES





CLARENCE ROLLING MILLS

Clarence Rolling Mills Co. Ltd.





Wire Drawing Shop

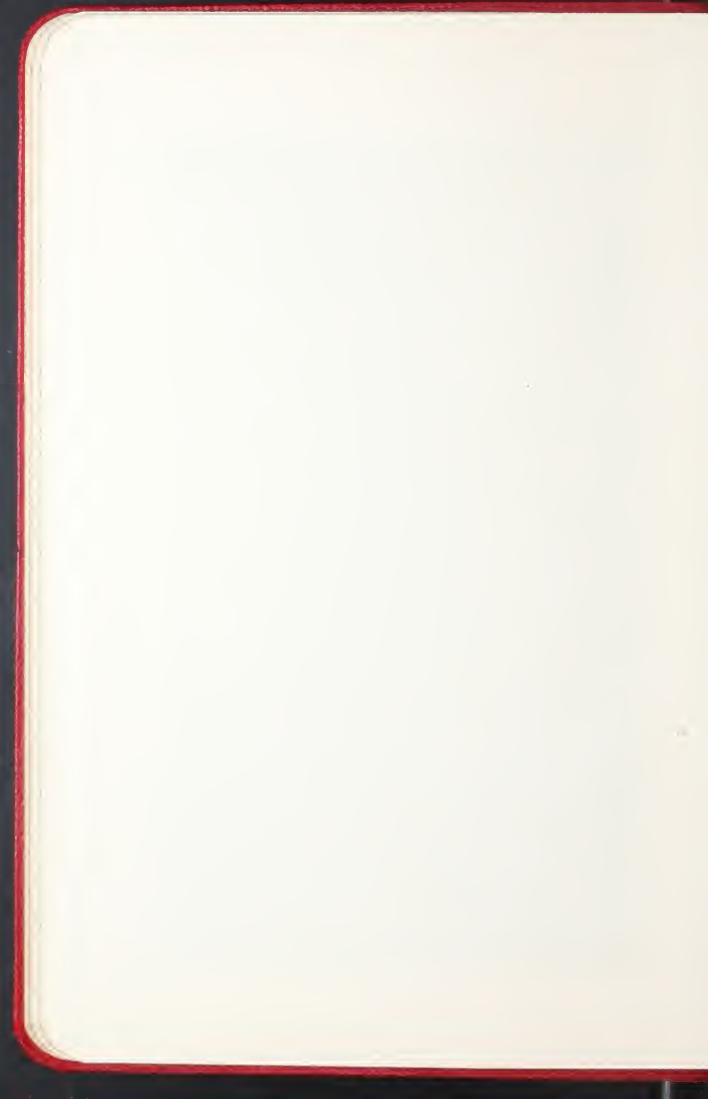
Cleveland Wire Works

CLEVELAND WIRE WORKS WIRE DRAWING SHOP



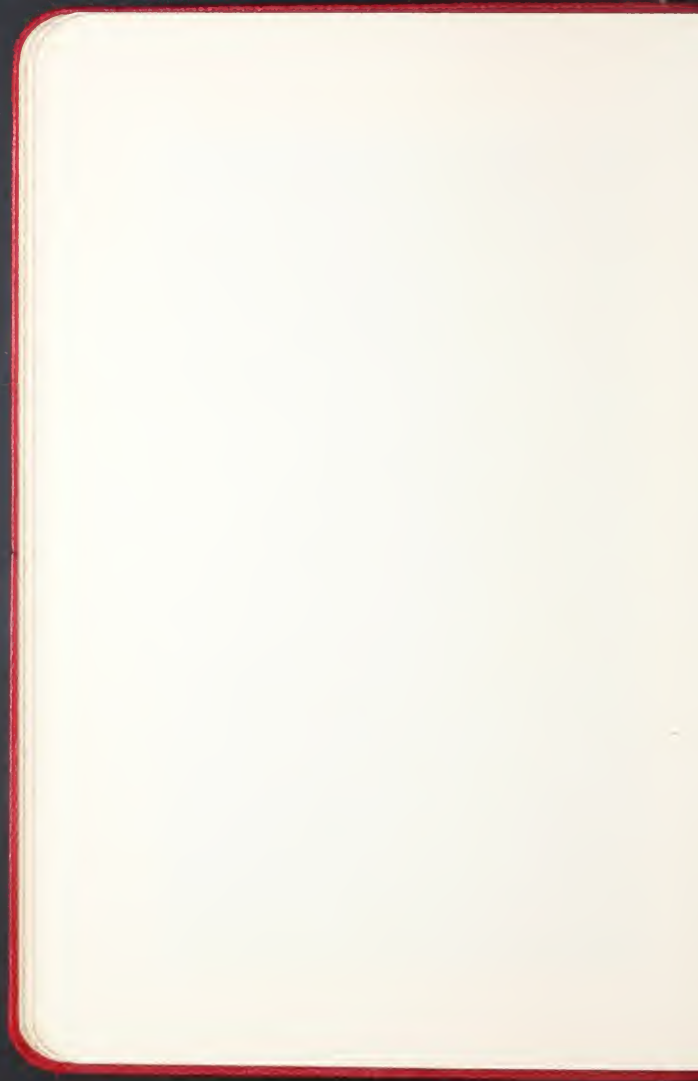


THE LARGEST BUILDING IN THE WORLD





SHEET DEPARTMENT CORRUGATING SHOP



DORMAN, LONG & CO. LIMITED.

PREFACE.

IN recent years there has been a large extension of the properties of this Company, and we feel that the several editions of our hand book—the first of which was issued in 1887—do not contain an adequate or complete account of the whole of our productions.

The property now comprises the following:—

Steel Furnaces.

Rolling Mills for all forms of structural material.

Construction and Bridge Shops.

Sheet Department (Rolling Mills with Galvanizing and Corrugating Shops).

Wire and Wire Rod Mills.

Rail, Billet, Bloom and Slab Mills.

A full description of the products of each department is given in the present edition.

We have endeavoured to bring before consumers the utility of our various products. The tabular and general information has been so arranged as to allow of an easy and convenient reference for the selection of the most economical form, for any given purpose.

All the information has been very carefully prepared by our own staff. It is in accordance with the best modern

DORMAN, LONG & CO. LIMITED.

practice, and meets the requirements of the leading Engineers, Architects, and others connected with Constructional Engineering, Shipbuilding and allied trades.

When the Engineering Standards Committee issued their list of British Standard Rolled Sections in 1903, the Company realised the advantages that would accrue from a general adoption of standard sections by both manufacturers and users, and at once made arrangements for rolling those that the market conditions appeared to demand. Certain sections, not included in the British Standard list, are also rolled by this Company to meet a special demand. Particulars of these will be found in the present edition.

Our steel is manufactured by the Basic Open Hearth process, which ensures an uniform and reliable product.

Our standard product for sectional material will give the following results under test :—

28.32 tons tensile stress per square inch.

20% elongation in eight inches.

40% reduction of area at point of fracture.

The steel is accepted by, and meets the requirements of, the several departments of His Majesty's Government, including the Board of Trade, War Office, India Office, Admiralty; also Lloyds and other surveys, and Engineers of the principal railways at home and abroad.

DORMAN, LONG & CO., LIMITED.

The stock of sections carried at Middlesbrough, London and Melbourne is in lengths of every foot from 10 feet to 40 feet for ordinary sections, and longer lengths can sometimes be obtained from stock.

The trade margin allowed in rolling structural material is $2\frac{1}{2}\%$ above or below the dimensions and weights listed, and we cannot undertake to execute any order without this allowance.

All sections, either from rolls or stock, are cut to a margin of 1" over or under specified lengths. No extra is charged for cutting to within $\frac{1}{8}$ " of exact length, and for machining square.

Attention is particularly directed to the full and complete list of sections designed for Shipbuilding purposes, for which line of business our mills are specially adapted.

The Constructional Shops have been specially equipped for the rapid production of all classes of structural work, including steel frame buildings, workshops and bridges, of all sizes. A few illustrations of work executed are included in this edition. As manufacturers of all classes of material required for such work, we carry at all times a large stock, and are thus in a most favourable position for the rapid execution of large or small contracts.

Our Constructional Department maintains a large and competent staff, prepared to submit designs and estimates at any time to meet customers' requirements.

DORMAN, LONG & CO. LIMITED.

At our London yard—Nine Elms Lane—a large quantity of material is always kept in stock, and as this branch also possesses well equipped shops, structural work of all classes can be obtained at short notice.

This Company have also a branch establishment at Melbourne, Australia, where an adequate stock of Beams, Angles and other material is held. This branch is also equipped to execute orders for all kinds of structural work.

We have endeavoured to standardise the details of ordinary constructional work to facilitate deliveries and effect economy for purchasers. If customers specify any of our standards for their requirements, we can give them better service than if their requirements are special or out of the ordinary, though these latter of course will have our best attention.

We trust that the form of the present pocket companion will be found acceptable. The accuracy attained in the calculations is such, that we have every confidence in recommending the use of the book to all requiring material manufactured by the Company, or who may be engaged in designing structures for which our products are adapted.

DORMAN, LONG & CO. LIMITED.

NOTES ON SECTIONS

Reference Marks.—The reference marks generally adopted throughout this work either indicate those sections determined by the British Standards Committee, or such as are being rolled to meet special demand; the former have the prefix B.S. (viz. :—British Standard), and the latter D.L. (viz. :—Dorman, Long & Co. Ltd.), thus affording a ready means of identification.

Sections marked *.—On referring to diagrams and tables, certain sections will be found marked with an asterisk.

Up to the present, the demand for these sections has been so limited that they have not been regularly rolled, neither are they kept in stock. They will be supplied, however, on receipt of orders for a sufficient quantity to warrant putting in the rolls.

DORMAN, LONG & CO. LIMITED.

Weight of Steel.—All calculations for weights are based on a piece of steel one square inch sectional area and one foot long, weighing 3·4 lbs., or one cubic foot of steel weighing 489·6 lbs.

Mode of ordering material.—I beams, channels, zeds, bulb angles and bulb tees, should be specified according to the weights per foot given in the diagrams and tables, rails to the weights per yard given, but angles, tees, flats, &c., to the thicknesses required.

Variation from published weights or thicknesses.—The minimum weights or thicknesses given in the diagrams and tables cannot be decreased, but may be exceeded when the tonnage ordered is sufficient to warrant a change being made; the effect upon the profile being as indicated on page 32.

It should be observed, however, that such change is only of limited extent.

DORMAN, LONG & CO. LIMITED.

I BEAMS



B.S.B. 30.

24" x 7 5/8" x 100 lbs per foot.

FOR PROPERTIES & SAFE LOADS SEE PAGES 34, 35, 46 & 47

DORMAN, LONG & CO. LIMITED.

I BEAMS



B.S.B. 29.

20 x 7.5 = 85 lbs per foot.



B.S.B. 28.

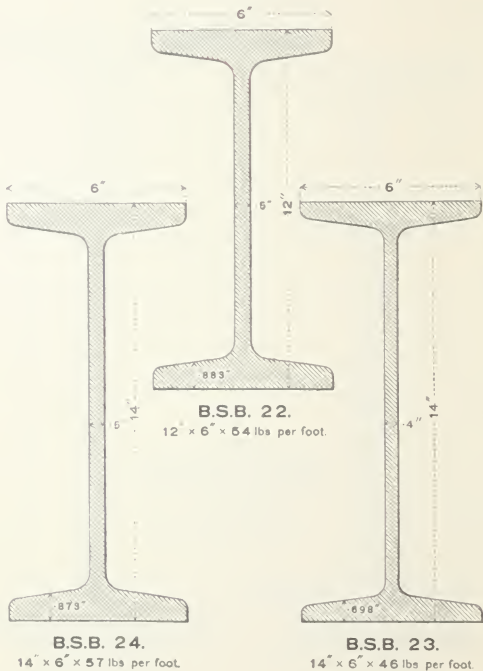
16 x 7 = 75 lbs per foot.

FOR PROPERTIES & SAFE LOADS SEE PAGES 34, 35, 46 & 47.

I BEAMS



I BEAMS



FOR PROPERTIES & SAFE LOADS SEE PAGES 34, 35, 46 & 47.

I BEAMS



I BEAMS



BSB 10.

10" x 8" = 10 lbs. per foot.



BSB 10.

10" x 8" = 42 lbs. per foot.



DLB 17A.

10" x 8" = 30 lbs. per foot.



BSB 17.

10" x 8" = 30 lbs. per foot.

FOR PROPERTIES & SAFE LOADS SEE PAGES 14, 25, 46 & 47.

DORMAN, LONG & CO. LIMITED

I BEAMS

**BSB 16.**

9' x 7' = 50 lbs. per foot.

**DLB 15A.**

9' x 35' = 215 lbs. per foot.

**BSB 15.**

9' x 4' = 27 lbs. per foot.

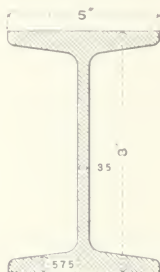
**BSB 14.**

6' x 6' = 36 lbs. per foot.

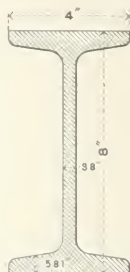
FOR PROPERTIES & SAFE LOADS SEE PAGES 14, 25, 49 & 47.

DORMAN, LONG & CO. LIMITED.

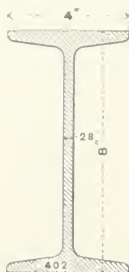
I BEAMS

**B.S.B. 13.**

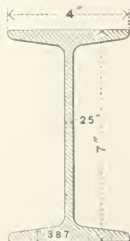
8" x 5" x 28 lbs per foot

**D.L.B. 12A.**

8" x 4" x 25 lbs per foot

**B.S.B. 12.**

8" x 4" x 18 lbs per foot.

**B.S.B. 11.**

7" x 4" x 16 lbs per foot.

FOR PROPERTIES & SAFE LOADS SEE PAGES 34, 35, 46 & 47.

DORMAN, LONG & CO LIMITED.

I BEAMS



D.L.B. 8A.

6 x 3 = 18 lbs per foot



B.S.B. 10.

6 x 5 = 25 lbs per foot



B.S.B. 9.

6 x 4 = 20 lbs per foot



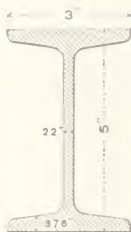
B.S.B. 8

6 x 3 = 12 lbs per foot

FOR PROPERTIES & SAFE LOADS SEE PAGES 34, 35, 46 & 47

DORMAN, LONG & CO. LIMITED.

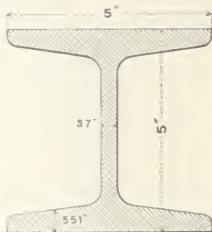
I BEAMS

**B.S.B. 6.**

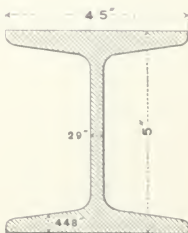
5 x 3 x 11 lbs per foot.

**D.L.B. 5A.**

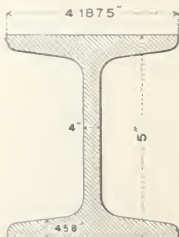
4 3/4 x 1 3/4 x 10 lbs per foot

**D.L.B. 7A.***

5 x 5 x 24 lbs per foot.

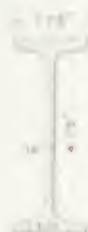
**B.S.B. 7.**

5 x 4 1/8 x 18 lbs per foot.

**D.L.B. 6A.**

5 x 4 1/8 x 19 lbs per foot.

I BEAMS



B.S.B. 5

4 1/2 x 7 1/2 = 33 1/2 lbs. per foot



B.S.B. 4

4 x 7 1/2 = 30 lbs. per foot



D.L.B. 3 1/2

4 1/2 x 7 1/2 = 33 1/2 lbs. per foot



D.L.B. 1 1/2

4 x 7 1/2 = 30 lbs. per foot



B.S.B. 3

4 x 7 1/2 = 30 lbs. per foot



B.S.B. 2 1/2

3 1/2 x 7 1/2 = 26 1/4 lbs. per foot



B.S.B. 1

3 x 7 1/2 = 22 1/2 lbs. per foot

FOR FREQUENCIES & RATE LOADS SEE PAGES 26, 27, 28 & 29

DORMAN, LONG & CO. LIMITED.

CHANNELS



B.S.C. 26.

 $12'' \times 4'' \times 36.47$ lbs per foot.

B.S.C. 25.

 $12'' \times 3\frac{1}{2}'' \times 32.88$ lbs per foot.

B.S.C. 24.

 $12'' \times 3'' \times 26.10$ lbs per foot.

B.S.C. 27.

 $15'' \times 4'' \times 41.94$ lbs per foot.

B.S.C. 22.

 $11'' \times 3\frac{1}{2}'' \times 29.82$ lbs per foot.

Each Section will be to correct profile for the weights given, but for increased weights the Section will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGES 36 AND 37.

HOBAS TUBE & CO LIMITED

CHANNELS



BSC 21

10.14 x 2.07 lb per ft



BLC 21A7

10.14 x 2.07 lb per ft



BSC 20

10.14 x 2.07 lb per ft



BSC 19

10.14 x 2.07 lb per ft



BSC 17

10.14 x 2.07 lb per ft



BSC 16

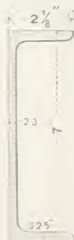
10.14 x 2.07 lb per ft

These channels will be delivered ready for use unless otherwise specified. All dimensions are in inches unless otherwise specified.

FOR TABLE OF PROPERTIES SEE PAGES 34 AND 35

DORMAN, LONG & CO. LIMITED.

CHANNELS

**B.S.C. 15.** $9 \times 3 \times 19.37$ lbs per ft.**B.S.C. 13.** $8 \times 3 \frac{1}{2} \times 22.72$ lbs per ft.**B.S.C. 12.*** $8 \times 3 \times 19.3$ lbs per ft.**B.S.C. 10.** $7 \times 3 \frac{1}{2} \times 20.23$ lbs per ft.**B.S.C. 9.** $7 \times 3 \times 17.56$ lbs per ft.**D.L.C. 9A.*** $7 \times 2 \frac{1}{8} \times 9.75$ lbs per ft.

Each Section will be in correct profile for the weights given, but for increased weights the Section will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGES 36 AND 37.

CHANNELS



C 4.5

4 1/2" DEEP PER 10 LB



C 6

6" DEEP PER 10 LB



C 6.5

6 1/2" DEEP PER 10 LB



C 8

8" DEEP PER 10 LB



C 10

10" DEEP PER 10 LB



C 12

12" DEEP PER 10 LB

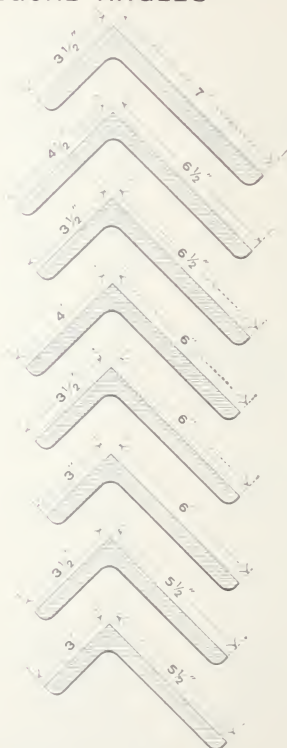
ALL DIMENSIONS ARE IN INCHES AND DECIMALS THEREOF

WEIGHTS AND SPACING ARE APPROXIMATE AND NOT TO BE USED FOR DESIGN

FOR TABLE OF PROPERTIES SEE TABLE ON PAGE 22

DORMAN, LONG & CO. LIMITED.

UNEQUAL ANGLES

BSUA 25.
Thicknesses $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ BSUA 24.
Thicknesses $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ BSUA 22.
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSUA 21.
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSUA 20.
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ DLUA 20.
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSUA 19.
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSUA 18*
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ 

Each Section will be to correct profile for the thicknesses given, but for intermediate or greater thicknesses the Section will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGES 38 AND 39.

UNEQUAL ANGLES

Sheet 10

10000



Sheet 11

10000



Sheet 12

10000



Sheet 13

10000



Sheet 14

10000



Sheet 15

10000



Sheet 16

10000



Sheet 17

10000



Sheet 18

10000



Sheet 19

10000



Sheet 20

10000



Sheet 21

10000



THESE DIAGRAMS ARE NOT TO BE USED FOR THE PURPOSE OF DETERMINING THE ANGLES OF THE FOLDS, BUT ONLY TO ILLUSTRATE THE EFFECT OF UNEQUAL ANGLES ON THE SHAPE OF THE FOLDS.

EQUAL ANGLES

BSEA 16
Thicknesses $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ BSEA 14
Thicknesses $\frac{7}{16}$ $\frac{5}{8}$ $\frac{3}{4}$ BSEA 13
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSEA 12
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSEA 11
Thicknesses $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSEA 10
Thicknesses $\frac{5}{16}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSEA 9
Thicknesses $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ BSEA 7.
Thicknesses $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{1}{2}$ BSEA 6.
Thicknesses $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ BSEA 5.
Thicknesses $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ BSEA 4.
Thicknesses $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ BSEA 3.
Thicknesses $\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ BSEA 2.
Thicknesses $\frac{3}{16}$ $\frac{1}{4}$

Each Section will be to correct profile for the thicknesses given, but for intermediate or greater thicknesses the Sections will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGE 40.

BULB ANGLES

B.S.B.A. 20.

 $W = 4.12948 \text{ in. per ft.}$ 

B.S.B.A. 19.

 $W = 3.10048 \text{ in. per ft.}$ 

B.S.B.A. 18.

 $W = 2.12647 \text{ in. per ft.}$ 

B.S.B.A. 16.

 $W = 2.12647 \text{ in. per ft.}$ 

B.S.B.A. 14.

 $W = 2.12647 \text{ in. per ft.}$ 

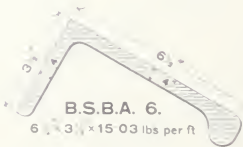
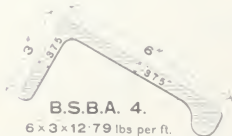
B.S.B.A. 12.

 $W = 2.12647 \text{ in. per ft.}$ 

Each member will be an average grade and may contain some minor surface irregularities.
Weights for members will be rounded up to nearest 10 lbs.

FOR TABLE OF PROPERTIES SEE PAGES 42 AND 43.

BULB ANGLES

B.S.B.A. 11. $8 \times 3 \times 18.02$ lbs per ft**B.S.B.A. 9.** $7 \times 3 \times 17.08$ lbs per ft**B.S.B.A. 8.** $7 \times 3 \times 16.8$ lbs per ft**B.S.B.A. 7.** $7 \times 3 \times 15.29$ lbs per ft**B.S.B.A. 6.** $6 \times 3 \times 15.03$ lbs per ft**B.S.B.A. 5.** $6 \frac{1}{2} \times 3 \times 13.61$ lbs per ft.**B.S.B.A. 4.** $6 \times 3 \times 12.79$ lbs per ft.**B.S.B.A. 3.** $5 \frac{1}{2} \times 3 \times 11.33$ lbs per ft.

Each Section will be to correct profile for the weights given, but for increased weights the Section will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGES 42 AND 43.

DOBBINS, LOSE & CO. LIMITED

ZEDS

DLZ 24

150 g/ha dry per ha

0.9.2 3

4-12 May 1994

0.524

IT 00 **log** **com:** **Report**

11. 2. 5.

476 478 480 482 484 486 488 490 492 494 496 498 500 502 504 506 508 510 512 514 516 518 520 522 524 526 528 530 532 534 536 538 540 542 544 546 548 550 552 554 556 558 560 562 564 566 568 570 572 574 576 578 580 582 584 586 588 590 592 594 596 598 600 602 604 606 608 610 612 614 616 618 620 622 624 626 628 630 632 634 636 638 640 642 644 646 648 650 652 654 656 658 660 662 664 666 668 670 672 674 676 678 680 682 684 686 688 690 692 694 696 698 700 702 704 706 708 710 712 714 716 718 720 722 724 726 728 730 732 734 736 738 740 742 744 746 748 750 752 754 756 758 760 762 764 766 768 770 772 774 776 778 780 782 784 786 788 790 792 794 796 798 800 802 804 806 808 810 812 814 816 818 820 822 824 826 828 830 832 834 836 838 840 842 844 846 848 850 852 854 856 858 860 862 864 866 868 870 872 874 876 878 880 882 884 886 888 890 892 894 896 898 900 902 904 906 908 910 912 914 916 918 920 922 924 926 928 930 932 934 936 938 940 942 944 946 948 950 952 954 956 958 960 962 964 966 968 970 972 974 976 978 980 982 984 986 988 990 992 994 996 998 1000

852 6

1997年12月15日

郭敬明 著

24-25 See page 100

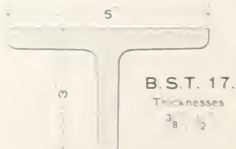
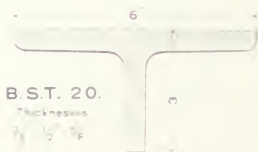
U.S. 2 11

© 1999 John Wiley & Sons, Inc.

SEE TABLE OF PROPERTIES
ON PAGE 38 & 39

DORMAN LONG & CO. LIMITED.

TEES



Each Section will be to correct profile for the thicknesses given.
Table and stalk of equal thickness.

FOR TABLE OF PROPERTIES SEE PAGE 41.

TEEN

KEY 11
 10 11
 12 13



KEY 14
 10 14
 15 16



KEY 10
 10 10
 11 12



KEY 13
 10 13
 14 15



KEY 12
 10 12
 13 14



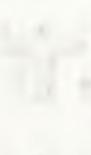
KEY 15
 10 15
 16 17



KEY 1
 10 1
 2 3

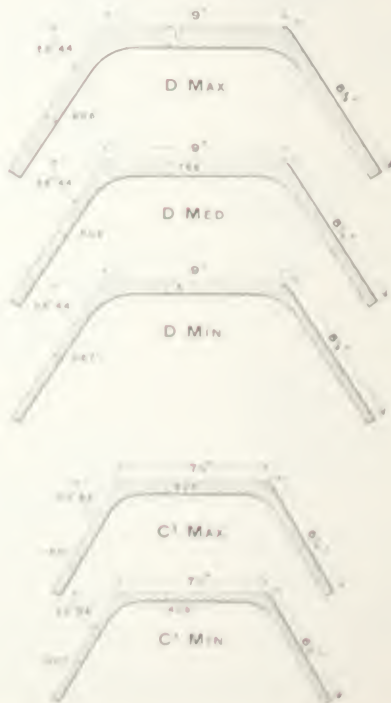


KEY 16
 10 16
 17 18



These diagrams are intended to be used as a guide only. They are not to be used as a substitute for the actual log.

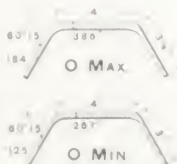
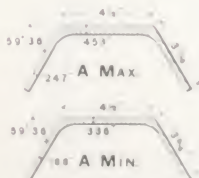
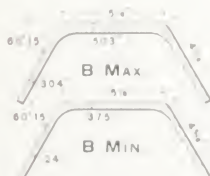
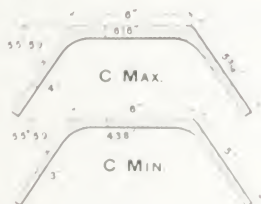
STEEL TROUGHING



FOR ABOVE, BUILT UP AS FLOORING, SEE PAGES 126 TO 149

DORMAN, LONG & CO. LIMITED.

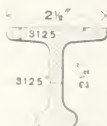
STEEL TROUGHING



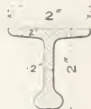
FOR ABOVE, BUILT UP AS FLOORING. SEE PAGES 123 TO 149

DORMAN, LONG & CO. LIMITED.

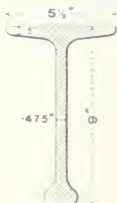
BULB TEES



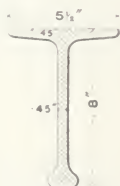
D.L.B.T. 1A.

 $2 \frac{1}{8} \times 2 \frac{1}{2} \times 5.98$ lbs per ft

D.L.B.T. 1B.

 $2 \times 2 \times 3.2$ lbs per ft.

B.S.B.T. 3.*

 $9 \times 5 \frac{1}{2} \times 26.76$ lbs per ft.

B.S.B.T. 2.*

 $8 \times 5 \frac{1}{2} \times 22.78$ lbs per ft.

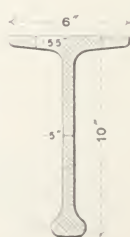
B.S.B.T. 1.*

 $7 \times 5 \times 19.01$ lbs per ft

B.S.B.T. 6.*

 $12 \times 6 \frac{1}{2} \times 42.49$ lbs per ft.

B.S.B.T. 5.*

 $11 \times 6 \frac{1}{2} \times 37.86$ lbs per ft.

B.S.B.T. 4.*

 $10 \times 6 \times 31.6$ lbs per ft.

Each Section will be to correct profile for the weights given, but for increased weights the Section will be modified as indicated on page 32.

FOR TABLE OF PROPERTIES SEE PAGES 42 AND 43.

RAILS



DORMAN, LONG & CO. LIMITED.

ROUNDS, SQUARES AND FLATS.

ROUNDS.



DIAMETERS

$\frac{1}{2}$ "	$\frac{9}{16}$ "	$\frac{5}{8}$ "	$\frac{11}{16}$ "	$\frac{3}{4}$ "
$\frac{13}{16}$ "	1"	$\frac{11}{16}$ "	1 $\frac{1}{16}$ "	
1 $\frac{1}{8}$ "	1 $\frac{3}{16}$ "	1 $\frac{1}{4}$ "	1 $\frac{5}{16}$ "	1 $\frac{3}{8}$ "
1 $\frac{7}{16}$ "	1 $\frac{1}{2}$ "	1 $\frac{5}{8}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "
2"	2 $\frac{1}{8}$ "	2 $\frac{1}{4}$ "	2 $\frac{3}{8}$ "	2 $\frac{1}{2}$ "

SQUARES.



SIDES.

$\frac{1}{2}$ "	$\frac{9}{16}$ "	$\frac{5}{8}$ "	$\frac{11}{16}$ "	$\frac{3}{4}$ "
$\frac{13}{16}$ "	$\frac{7}{8}$ "	$\frac{15}{16}$ "	1"	1 $\frac{1}{16}$ "
1 $\frac{1}{8}$ "	1 $\frac{1}{16}$ "	1 $\frac{1}{4}$ "	1 $\frac{5}{16}$ "	1 $\frac{3}{8}$ "
1 $\frac{7}{16}$ "	1 $\frac{1}{2}$ "	1 $\frac{5}{8}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "
2"	2 $\frac{1}{8}$ "	2 $\frac{1}{4}$ "		

FLATS.



Width Inches	Thickness		Width Inches	Thickness	
	Minimum	Maximum		Minimum	Maximum
24	$\frac{5}{16}$	$\frac{7}{8}$	3 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$
20 $\frac{1}{4}$	$\frac{1}{8}$	$\frac{7}{8}$	3 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$
18	$\frac{3}{8}$	$\frac{3}{4}$	3	$\frac{1}{4}$	$\frac{3}{4}$
16	$\frac{1}{2}$	$\frac{3}{4}$	2 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{3}{4}$
14	$\frac{3}{8}$	$\frac{3}{4}$	2 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$
13	$\frac{3}{8}$	$\frac{3}{4}$	2 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$
12	$\frac{3}{8}$	$\frac{3}{4}$	2	$\frac{1}{4}$	$\frac{3}{4}$
10	$\frac{3}{8}$	$\frac{3}{4}$	1 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{5}{8}$
9	$\frac{3}{8}$	$\frac{3}{4}$	1 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$
8	$\frac{3}{8}$	$\frac{3}{4}$	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$
4	$\frac{1}{4}$	$\frac{3}{4}$	1	$\frac{1}{4}$	$\frac{1}{2}$
3 $\frac{3}{4}$	$\frac{1}{4}$	$\frac{3}{4}$			

NOTE: Flats of greater thickness than the above will have the edges slightly rounded.

MISCELLANEOUS SECTIONS



NO. 3 HATCH



BOBBIN SECTIONS

HOLLOW HALF ROUNDS



SOLID HALF ROUNDS



NUT STEEL

FENCING STANDARD

2 1/2 x 1/2



RIVET BARS

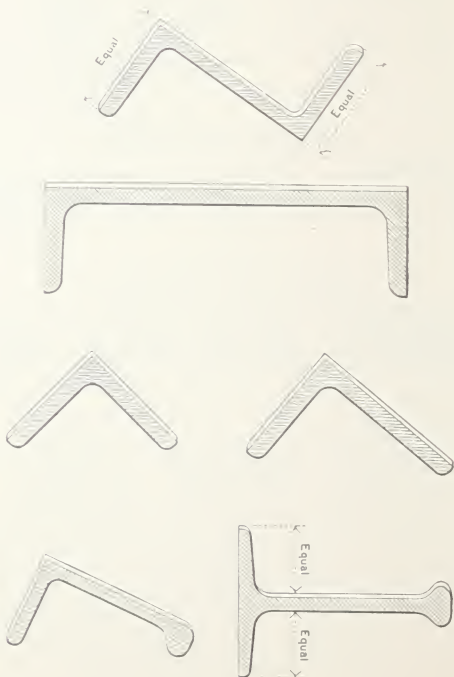
A = B	A = B
1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2

A = B	A = B	A = B	A = B
1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2
1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2	1 1/2 x 1 1/2

DORMAN, LONG & CO. LIMITED.

DIAGRAM SHEWING PROFILES OBTAINED WHEN SECTIONS ARE ROLLED OF THICKNESSES OTHER THAN THOSE GIVEN ON THE PRECEDING PAGES.


The hatched portions indicate correct profiles, the blank portions the added material.



DORMAN, LONG & CO. LIMITED.

DIMENSIONS AND PROPERTIES OF I BEAMS.

For safe distributed loads see pages 46 and 47

	Reference Mark	Size Inches	Weight per Foot lbs	DIAGRAM			
				Web t	Flange T	Radius R1	Radius R2
	BSB 30	24 7	100	6	1 07	7	35
	29	20 7	89	6	1 01	7	35
	28	18 7	75	55	928	65	325
	27	16 6	62	55	847	65	325
	26	15 6	59	5	88	6	3
	25	15 5	42	42	647	52	26
	24	14 6	57	5	873	6	3
	23	14 6	46	4	698	5	25
	22	12 6	54	5	883	6	3
	21	12 6	44	4	717	5	25
	DLB 20A	12 5	39	44	664	54	27
	BSB 20	12 5	32	35	55	45	225
	19	10 8	70	6	97	7	35
	18	10 6	42	4	736	5	25
	DLB 17A	10 5	35	42	652	52	26
	BSB 17	10 5	30	36	552	46	23
	16	9 7	58	55	924	65	325
	DLB 15A	9 3	21 5	34	453	44	22
	BSB 15	9 4	21	3	46	4	2
	14	8 6	35	44	597	54	27
	13	8 5	28	35	575	45	225
	DLB 12A	8 4	25	38	581	48	24
	BSB 12	8 4	18	28	402	38	19
	11	7 4	16	25	387	35	175
	10	6 5	25	41	52	51	255
	9	6 4	20	37	431	47	235
	DLB 8A	6 3	16	34	484	44	22
	BSB 8	6 3	12	26	348	36	18
	DLB 7A	5 5	24	37	551	47	235
	BSB 7	5 4	18	29	448	39	195
	DLB 6A	5 4	19	40	458	50	25
	BSB 6	5 3	11	22	376	32	16
	DLB 5A	4 5	10	32	48	32	16
	BSB 5	4 5	6 5	18	325	28	14
	4	4 3	9 5	22	336	32	16
	DLB 3A	4 1	8	3	383	3	15
	BSB 3	4 1	5	17	24	27	135
	2*	3 3	8 5	2	332	3	15
	DLB 1A	3 1	6	25	344	25	125
	BSB 1	3 1	4	16	248	26	13

The properties of British Standard Sections in above table are published by permission of the Engineering Standards Committee.

DORMAN, LONG & CO LIMITED.

DIMENSIONS AND PROPERTIES OF I BEAMS.

For safe distributed loads see pages 46 and 47.


Area Square Inches	Moments of Inertia		Radii of Gyration Inches		Section Modulus	Centres of Holes c Inches	Reference Mark
	About x-x	About y-y	About x-x	About y-y			
20'4	2654	66.92	9.5	1.8	221.1	4.8	848 001
20'17	1670	62.63	7.99	1.54	167.0	4.6	24
22'06	1149	47.04	7.21	1.40	127.6	4.0	28
18'22	795.7	27.08	6.21	1.21	90.71	3.5	71
17'35	650.9	26.24	6.06	1.27	80.85	3.5	70
12'35	428	11.81	5.88	1.074	57.60	2.75	56
16'76	582.9	27.06	6.63	1.26	70.12	3.6	58
14'63	440.5	21.6	6.7	1.26	62.92	3.0	60
15'84	375.5	26.3	4.46	1.73	62.08	3.5	62
12'04	315.3	22.27	4.66	1.33	52.76	3.0	53
11'47	260.9	19.16	4.77	1.08	43.48	2.75	51.5 20x
9'41	220	9.755	4.85	1.01	36.06	2.75	54.5 20x
20'6	644.0	71.67	4.00	1.66	60.08	4.75	13
12'35	211.5	22.05	4.13	1.06	42.3	3.2	18
10'29	167.2	11.00	4.03	1.07	33.45	2.75	51.5 17x
8'82	145.9	9.79	4.06	1.06	30.12	2.75	52.5 17x
17'06	299.5	46.3	6.06	1.34	51.0	4.0	20
9'224	63.41	3.440	6.69	7.89	16.03	3.0	51.5 15x
8'176	41.1	4.2	6.02	8.24	16.03	3.25	52.5 15x
10'26	110.5	17.96	6.27	1.32	27.63	3.2	18
9'24	89.02	10.26	6.36	1.11	22.63	2.75	18
7'352	75.06	6.602	6.16	8.05	16.77	2.55	51.5 12x
5'204	55.69	3.678	6.24	3.55	13.42	2.55	52.5 12x
4'766	29.31	3.414	6.23	3.51	11.2	2.55	11
7'35	42.61	6.116	2.43	1.31	13.63	2.75	16
5'48	34.63	5.415	2.42	9.69	11.34	2.5	5
4'706	26.16	1.857	2.36	6.45	8.716	1.5	55.5 9x
3'68	20.31	1.339	2.39	6.16	6.790	1.5	54.5 8
7'058	26.30	6.791	2.04	1.18	11.72	2.75	52.5 7x
5'29	23.66	5.664	3.07	1.02	6.076	2.5	53.5 7
5'586	32.44	4.726	3.60	6.23	6.637	2.55	51.5 6x
3'235	13.67	1.462	2.05	8.72	5.444	1.5	55.5 5
2'941	9.275	4.13	1.78	6.75	3.905	1.5	56 5x
1'912	6.73	2.66	1.67	3.7	2.353	1.5	56 5
2'704	7.52	1.361	1.64	6.77	3.70	1.5	4
2'363	5.526	3.24	1.50	6.71	2.664	1.5	51.5 3x
1'47	3.666	1.66	1.55	3.53	1.534	1.5	51.5 3
2'5	3.787	1.242	1.55	7.1	2.534	1.5	2x
1'785	2.080	1.65	1.62	3.52	1.703	1.5	51.5 2x
1'170	1.669	1.24	1.33	3.24	1.196	1.5	52.5 2

The properties of British Standard Sections as shown above are furnished by permission of the Engineering Standards Committee.

DORMAN, LONG & CO. LIMITED.


CHANNELS.

DIMENSIONS AND PROPERTIES.

	Reference Mark	Size A B		Standard Thicknesses		Radii		Weight per foot—lbs.
				t	T	R	r	
	BSC 27	15	4	525	630	630	440	41·94
	20	12	4	525	625	625	425	38·47
	25	12	3	500	600	600	425	32·88
	24	12	3	375	500	500	350	28·10
	22	11	3	475	575	575	400	29·82
	21	10	4	475	575	575	400	30·16
	DLO 21A*	10	4	312	312	600	200	18·86
	BSC 20	10	3	475	575	575	400	28·21
	19	10	3	375	500	500	350	23·55
	17	9	3	450	550	550	375	25·39
	16	9	3	375	500	500	350	22·27
	15	9	3	375	437	437	350	19·37
	13	8	3	425	525	525	375	22·72
	12*	8	3	375	500	500	350	19·30
	10	7	3	400	500	500	350	20·23
	9	7	3	375	475	475	325	17·56
DLO	9A*	7	2	230	325	325	230	9·75
BSC	8	6	3	375	475	475	325	17·9
	6	6	3	312	437	437	300	14·49
DLO	5A	5	2	437	500	500	350	16·08
	4A	4	2	500	500	500	350	12·92
	3A	4	3	375	500	500	350	14·20
	2A	2	1	312	312	250	200	4·14

ZED BARS.

DIMENSIONS AND PROPERTIES.

	Minor Axis	Y	X	Reference Mark	Size A B	Standard Thicknesses		Area square inches	Weight per foot— lbs.
						t	T		
BSZ 8	10	3½	475	575	8·283	28·16			
7	9	3½	450	550	7·449	25·33			
6	8	3½	425	525	6·670	22·68			
5	7	3½	400	500	5·948	20·22			
4	6	3½	375	475	5·258	17·88			
3	5	3	350	450	4·169	14·17			
DLZ 2A	4	3	325	425	3·605	12·26			

The properties of British Standard Sections in above tables, where taken from the Engineering Standards Committee's Section Book, are published by permission of the Committee.

TOWN OF LENOIR, N. C.

CHANNELS

DIMENSIONS AND PROPERTIES

Sta. from Head	Channel No.	Cross-Section		Slope, Feet		Area of Section, sq. ft.		Per Cent
		Top ft.	Base ft.	Left ft.	Right ft.	Left ft.	Right ft.	
100	100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120	120
121	121	121	121	121	121	121	121	121
122	122	122	122	122	122	122	122	122
123	123	123	123	123	123	123	123	123
124	124	124	124	124	124	124	124	124
125	125	125	125	125	125	125	125	125
126	126	126	126	126	126	126	126	126
127	127	127	127	127	127	127	127	127
128	128	128	128	128	128	128	128	128
129	129	129	129	129	129	129	129	129
130	130	130	130	130	130	130	130	130
131	131	131	131	131	131	131	131	131
132	132	132	132	132	132	132	132	132
133	133	133	133	133	133	133	133	133
134	134	134	134	134	134	134	134	134
135	135	135	135	135	135	135	135	135
136	136	136	136	136	136	136	136	136
137	137	137	137	137	137	137	137	137
138	138	138	138	138	138	138	138	138
139	139	139	139	139	139	139	139	139
140	140	140	140	140	140	140	140	140
141	141	141	141	141	141	141	141	141
142	142	142	142	142	142	142	142	142
143	143	143	143	143	143	143	143	143
144	144	144	144	144	144	144	144	144
145	145	145	145	145	145	145	145	145
146	146	146	146	146	146	146	146	146
147	147	147	147	147	147	147	147	147
148	148	148	148	148	148	148	148	148
149	149	149	149	149	149	149	149	149
150	150	150	150	150	150	150	150	150

RED BARS

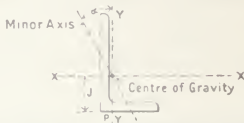
DIMENSIONS AND PROPERTIES

Sta. from Head	Bar No.	Cross-Section		Slope, Feet		Area of Section, sq. ft.	Per Cent
		Top ft.	Base ft.	Left ft.	Right ft.		
100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120
121	121	121	121	121	121	121	121
122	122	122	122	122	122	122	122
123	123	123	123	123	123	123	123
124	124	124	124	124	124	124	124
125	125	125	125	125	125	125	125
126	126	126	126	126	126	126	126
127	127	127	127	127	127	127	127
128	128	128	128	128	128	128	128
129	129	129	129	129	129	129	129
130	130	130	130	130	130	130	130
131	131	131	131	131	131	131	131
132	132	132	132	132	132	132	132
133	133	133	133	133	133	133	133
134	134	134	134	134	134	134	134
135	135	135	135	135	135	135	135
136	136	136	136	136	136	136	136
137	137	137	137	137	137	137	137
138	138	138	138	138	138	138	138
139	139	139	139	139	139	139	139
140	140	140	140	140	140	140	140
141	141	141	141	141	141	141	141
142	142	142	142	142	142	142	142
143	143	143	143	143	143	143	143
144	144	144	144	144	144	144	144
145	145	145	145	145	145	145	145
146	146	146	146	146	146	146	146
147	147	147	147	147	147	147	147
148	148	148	148	148	148	148	148
149	149	149	149	149	149	149	149
150	150	150	150	150	150	150	150

The properties of these bars are given in the following table, and the corresponding dimensions of the bars are given in the following table.

DORMAN, LONG & CO. LIMITED.

UNEQUAL ANGLES. DIMENSIONS AND PROPERTIES.



Reference Mark	Size and Thickness	Area Square Inches	Weight per Foot Lbs.	Radii		Dimensions		Moments of Inertia		Section Moduli		Angle C Degrees	Least Radius of Gyration
				Root	Toe	J	P	About x x	About y y	About x x	About y y		
BSUA 25	7 3	5.0	17.00	425	300	2.50	.764	25.1	4.22	5.58	1.56	141	.74
" 25	" 3	6.17	20.40	425	300	2.55	.814	30.55	5.15	6.86	1.92	141	.74
" 25	" 3	7.31	24.66	425	300	2.60	.862	35.68	5.95	8.11	2.26	141	.73
" 24	6 4	5.24	17.24	425	325	2.08	1.09	22.2	3.75	5.02	1.57	25	.97
" 24	" 4	6.40	22.04	425	325	2.13	1.14	27.09	4.60	6.20	1.85	25	.96
" 24	" 4	7.65	26.13	425	325	2.18	1.19	31.66	5.32	7.33	2.25	25	.96
" 22	5 3	3.5	10.13	425	300	2.22	.741	15.7	3.27	3.67	1.18	161	.75
" 22	" 3	4.75	16.12	425	300	2.28	.792	20.4	4.20	4.83	1.55	161	.75
" 22	" 3	5.96	19.33	425	300	2.33	.841	24.83	5.06	5.95	1.90	161	.74
" 21	6 4	3.61	12.27	425	300	1.92	.923	13.2	4.73	2.31	1.54	231	.87
" 21	" 4	4.75	16.15	425	300	1.96	.974	17.1	6.10	2.32	1.02	231	.86
" 21	" 4	5.86	19.92	425	300	2.02	1.02	20.8	7.36	2.32	1.47	231	.86
" 20	6 3	3.42	11.64	40	275	2.01	.773	12.6	3.22	3.16	1.18	19	.76
" 20	" 3	4.50	15.31	40	275	2.06	.823	16.4	4.14	3.16	1.55	19	.75
" 20	" 3	5.54	18.87	40	275	2.11	.872	19.88	4.97	3.16	1.89	19	.75
DLUA 20A	3	3.23	11.00	40	275	2.12	.632	12.0	2.05	3.09	.87	14	.64
" 20A	" 3	4.25	14.46	40	275	2.17	.683	15.5	2.62	4.05	1.13	14	.63
" 20A	" 3	5.23	17.80	40	275	2.22	.731	18.79	3.13	4.97	1.38	14	.63
BSUA 19	5 3	3.23	11.00	40	275	1.80	.807	9.33	3.15	2.68	1.17	22	.76
" 19	" 3	4.25	14.46	40	275	1.85	.857	12.80	4.05	3.51	1.53	22	.75
" 19	" 3	5.23	17.80	40	275	1.90	.905	15.6	4.86	4.33	1.87	21	.75
" 18*	5 3	3.05	10.37	375	250	1.90	.662	9.45	2.02	2.62	.86	17	.64
" 18*	" 3	4.00	13.61	375	250	1.96	.711	12.2	2.58	3.44	1.13	16	.64
" 18*	" 3	4.92	16.74	375	250	2.00	.759	14.7	3.08	4.20	1.37	16	.63
" 17	5 4	3.23	11.00	40	275	1.51	1.01	7.96	4.53	2.28	1.52	32	.85
" 17	" 4	4.25	14.46	40	275	1.56	1.06	10.3	5.82	2.99	1.93	32	.84
" 17	" 4	5.23	17.80	40	275	1.60	1.11	12.4	7.01	3.66	2.43	32	.83
" 16	5 3	3.05	10.37	375	250	1.59	.848	7.64	3.09	2.24	1.17	25	.75
" 16	" 3	4.00	13.61	375	250	1.64	.897	9.86	3.96	2.93	1.52	25	.75
" 16	" 3	4.92	16.74	375	250	1.69	.944	11.9	4.75	3.60	1.86	25	.74

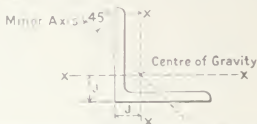
DORMAN, LONG & CO. LIMITED.

UNEQUAL ANGLES. DIMENSIONS AND PROPERTIES.

Reference Mark	Size and Thickness	Area Square Inches	Weight per Foot - Lbs.	Radii		Dimensions		Moments of Inertia		Section Moduli		Angle Degrees	Least Radius of Gyration
				Root	Toe	J	W	About x x	About y y	About x x	About y y		
BSUA 15	5 x 3	2.402	8.17	350	250	1.66	667	6.14	1.60	1.24	1.24	75.30	61
" 15	"	2.859	9.72	350	250	1.68	693	7.24	1.97	2.18	1.85	85.19	63
" 15	"	3.749	12.75	350	250	1.73	743	9.03	2.51	2.65	1.11	111.19	64
" 15	"	4.609	15.67	350	250	1.78	789	11.25	3.00	3.43	3.19	138.19	64
" 14*	4 x 3	2.402	8.17	350	250	1.36	366	4.32	2.55	1.54	1.54	97.30	74
" 14*	"	2.859	9.72	350	250	1.39	381	5.00	3.00	1.83	1.57	115.70	74
" 14*	"	3.749	12.75	350	250	1.44	394	7.31	3.84	2.56	1.50	135.30	74
" 14*	"	4.609	15.67	350	250	1.48	397	8.81	4.01	3.32	1.83	161.30	74
" 12	4 x 3	2.246	7.64	350	250	1.16	311	3.46	2.47	1.22	1.22	96.37	72
" 12	"	2.671	9.08	350	250	1.19	341	4.08	2.90	1.45	1.37	113.57	72
" 12	"	3.499	11.90	350	250	1.24	390	5.25	3.71	1.81	1.47	141.57	72
" 12	"	4.295	14.61	350	250	1.28	404	6.38	4.44	2.31	1.80	168.80	72
" 11	4 x 3	2.091	7.11	325	225	1.24	274	3.51	1.53	1.20	1.20	71.20	61
" 11	"	2.485	8.45	325	225	1.27	271	4.29	1.87	1.48	1.22	84.22	61
" 11	"	3.251	11.05	325	225	1.31	311	4.98	2.17	1.65	1.08	108.30	61
" 11	"	3.985	13.55	325	225	1.36	325	5.96	2.35	2.25	1.38	138.20	61
" 9	3 x 3	1.934	6.58	325	225	1.04	270	2.27	1.53	1.00	1.00	69.35	62
" 9	"	2.298	7.81	325	225	1.07	310	2.67	1.80	1.10	1.10	83.20	62
" 9	"	3.010	10.20	325	225	1.11	337	3.40	2.32	1.42	1.07	107.51	61
" 9	"	3.673	12.49	325	225	1.16	352	4.05	2.71	1.73	1.30	130.35	61
" 8	3 x 2	1.773	6.05	30	20	1.12	627	2.15	0.10	1.00	1.00	41.50	54
" 8	"	2.111	7.18	30	20	1.15	655	2.42	1.06	1.00	1.00	57.06	54
" 8	"	2.752	9.36	30	20	1.20	690	3.20	1.34	1.20	1.20	74.20	54
" 7	3 x 2	1.312	4.46	275	20	895	648	1.14	716	54	54	33.34	52
" 7	"	1.921	6.53	275	20	945	897	1.62	1.02	73	73	51.81	52
" 7	"	2.499	8.50	275	20	1002	744	2.15	1.23	1.02	1.02	73.53	52
" 6	3 x 2	1.187	4.04	275	20	978	438	1.05	977	52	52	25.23	41
" 6	"	1.735	5.29	275	20	1003	532	1.30	1.22	75	75	36.23	41
" 6	"	2.343	7.65	275	20	1077	577	1.89	1.16	80	80	46.22	41
" 5	2 x 2	1.063	3.61	250	175	774	527	636	366	37	37	24.32	42
" 5	"	1.309	4.45	250	175	799	552	770	433	45	45	30.51	42
" 5	"	1.547	5.25	250	175	823	575	895	502	53	53	36.51	42
" 4	2 x 1	622	2.11	225	150	627	381	640	115	17	17	10.28	32
" 4	"	814	2.77	225	150	653	457	808	146	23	23	13.22	31
" 4	"	997	3.39	225	150	678	431	1069	174	28	28	16.28	31

DORMAN, LONG & CO. LIMITED.

EQUAL ANGLES. DIMENSIONS AND PROPERTIES.



Reference Mark	Size and Thickness	Area Square Inches	Weight per Foot Lbs.	Radii		Dimension J	Moment of Inertia x x	Section Modulus x x	Least Radius of Gyration
				Root	Toe				
BSEA 16*		7.75	26.35	.600	.425	2.15	47.4	8.10	1.58
" 16*		8.609	32.67	.600	.425	2.20	58.2	10.03	1.57
" 16*		11.437	39.39	.600	.425	2.25	68.5	11.91	1.56
" 14		6.062	17.21	.475	.325	1.64	17.3	3.97	1.18
" 14		7.112	24.11	.475	.325	1.71	23.8	5.55	1.18
" 14		8.441	28.70	.475	.325	1.76	27.8	6.56	1.17
" 13		5.610	12.27	.425	.300	1.37	8.51	2.34	.98
" 13		4.780	16.15	.425	.300	1.42	11.0	3.07	.98
" 13		5.660	16.22	.425	.300	1.47	13.4	3.80	.98
" 12*		5.236	11.00	.400	.275	1.22	6.14	1.87	.88
" 12*		4.253	14.46	.400	.275	1.29	7.92	2.47	.87
" 12*		5.226	17.20	.400	.275	1.34	9.56	3.03	.87
" 11		3.575	9.72	.350	.250	1.12	4.26	1.48	.78
" 11		5.749	12.75	.350	.250	1.17	5.46	1.93	.77
" 11		4.605	16.67	.350	.250	1.22	6.56	2.36	.77
" 10		2.091	7.11	.325	.225	.975	2.39	.56	.68
" 10		2.485	9.45	.325	.225	1.00	2.80	1.12	.68
" 10		3.221	11.05	.325	.225	1.05	3.57	1.46	.68
" 10		3.985	13.55	.325	.225	1.09	4.27	1.77	.68
" 9		1.44	4.90	.300	.200	.827	1.21	.56	.59
" 9		2.111	7.18	.300	.200	.877	1.72	.81	.53
" 9		2.752	9.36	.300	.200	.924	2.19	1.05	.58
" 9		3.362	11.43	.300	.200	.970	2.59	1.28	.58
" 7		1.197	4.04	.275	.200	.703	.677	.38	.48
" 7		1.464	4.98	.275	.200	.725	.822	.46	.48
" 7		1.733	5.89	.275	.200	.752	.962	.55	.48
" 7		2.249	7.65	.275	.200	.799	1.21	.71	.43
" 6		.700	2.75	.250	.175	.616	.378	.23	.44
" 6		1.063	3.61	.250	.175	.643	.489	.30	.44
" 6		1.300	4.45	.250	.175	.668	.592	.37	.43
" 6		1.547	5.26	.250	.175	.692	.685	.44	.43
" 5		.715	2.43	.225	.175	.554	.260	.18	.39
" 5		.932	3.19	.250	.175	.581	.336	.24	.39
" 5		1.153	3.92	.250	.175	.605	.401	.29	.38
" 5		1.36	4.62	.250	.175	.629	.467	.34	.38
" 4		.622	2.11	.225	.150	.445	.172	.14	.34
" 4		.814	2.77	.225	.150	.520	.220	.18	.34
" 4		.997	3.39	.225	.150	.544	.264	.22	.34
" 3	1	.526	1.79	.200	.150	.434	.105	.10	.29
" 3		.626	2.33	.200	.150	.458	.134	.13	.23
" 3		.839	2.35	.200	.150	.422	.153	.16	.23
" 2	1	.433	1.47	.200	.150	.371	.053	.07	.24
" 2		.561	1.81	.200	.150	.396	.073	.09	.23

DORMAN, LONG & CO. LIMITED.

TEES.
DIMENSIONS AND PROPERTIES.


Reference Mark	Size and Thickness	Area Square Inches	Weight per foot - lbs.	Radii		Dimension	Moments of Inertia		Section Moduli		Radii of Gyration	
				Table Root	Table Toe		About xx	About yy	About xx	About yy	About xx	About yy
BST 21	6 x 4	3.634	12.36	425	300	915	4.700	6.344	1.52	2.11	1.13	1.32
" 21	" " "	4.771	16.22	425	300	928	6.070	8.621	2.00	2.85	1.29	1.54
" 21	" " "	5.878	19.99	425	300	1.02	7.350	10.818	2.47	3.64	1.14	1.36
" 20	6 x 3	3.260	11.08	400	275	633	2.062	6.329	1.12	1.13	1.00	1.00
" 20	" " "	4.272	14.53	400	275	684	2.635	8.649	1.42	1.68	1.05	1.23
" 20	" " "	5.256	17.87	400	275	732	3.144	10.939	1.69	2.01	1.07	1.23
" 19	5 x 4	3.257	11.07	400	275	988	4.471	3.631	1.49	1.48	1.12	1.06
" 19	" " "	4.268	14.51	400	275	1.05	5.772	5.017	1.66	1.61	1.03	1.03
" 17	5 x 3	2.875	9.78	350	250	691	1.973	3.716	1.15	1.49	1.02	1.17
" 17	" " "	3.768	12.79	350	250	741	2.516	5.051	1.15	1.61	1.03	1.16
" 15	4 x 4	2.872	9.77	350	250	1.11	4.189	1.901	1.45	1.45	1.00	1.00
" 15	" " "	3.758	12.78	350	250	1.16	5.402	2.800	1.60	1.61	1.03	1.03
" 14	4 x 3	2.498	8.49	325	225	767	1.660	1.914	1.25	1.36	0.95	0.95
" 14	" " "	3.262	11.08	325	225	816	2.365	2.599	1.25	1.36	0.95	0.95
" 13	3 x 3	2.495	8.49	325	225	988	2.763	1.284	1.10	1.10	0.95	0.95
" 13	" " "	3.259	11.08	325	225	1.04	3.643	1.758	1.44	1.44	1.00	1.00
" 11	3 x 3	2.121	7.21	300	200	968	1.704	1.216	1.05	1.05	0.94	0.94
" 11	" " "	2.76	9.38	300	200	918	2.165	1.115	1.04	1.04	0.94	0.94
" 10	3 x 2	1.929	6.56	275	200	935	1.016	1.114	0.56	0.56	0.74	0.74
" 10	" " "	2.506	8.52	275	200	942	1.275	1.109	0.73	0.74	0.73	0.73
" 8	2 x 2	1.197	4.07	275	200	697	0.677	0.902	0.38	0.38	0.54	0.54
" 8	" " "	1.474	5.01	275	200	774	0.825	0.887	0.46	0.46	0.51	0.51
" 8	" " "	1.742	5.92	275	200	750	0.969	0.973	0.55	0.55	0.48	0.48
" 7	2 x 2	1.071	3.64	250	175	638	0.491	0.524	0.30	0.30	0.46	0.46
" 7	" " "	1.554	5.20	250	175	683	0.683	0.54	0.34	0.34	0.41	0.41
" 6	2 x 2	0.947	3.22	200	175	579	0.377	0.157	0.24	0.16	0.36	0.36
" 6	" " "	1.367	4.64	250	175	622	0.465	0.24	0.34	0.25	0.36	0.36
DLT 6A	2 x 1	0.320	2.79	225	150	400	0.148	0.159	0.14	0.16	0.42	0.41
" 6A	" " "	1.100	4.01	225	150	435	0.202	0.246	0.19	0.25	0.41	0.45
BST 5	1 x 2	0.220	2.79	225	150	640	0.307	0.068	0.23	0.09	0.612	0.292
" 5	" " "	1.003	3.41	225	150	674	0.369	0.082	0.26	0.12	0.607	0.296
" 4	1 x 1	0.320	2.79	225	150	519	0.221	0.107	0.13	0.12	0.500	0.361
" 4	" " "	0.999	3.40	225	150	544	0.265	0.137	0.22	0.16	0.510	0.370
" 3	1 x 1	0.231	1.81	200	150	475	0.106	0.045	0.10	0.06	0.447	0.301
" 3	" " "	0.692	2.35	200	150	460	0.135	0.067	0.13	0.09	0.442	0.312

The properties of British Standard Sections in above table, where taken from the Engineering Standards Committee's Section Book, are published by permission of the Committee.

DORMAN, LONG & CO. LIMITED.

BULB ANGLES.

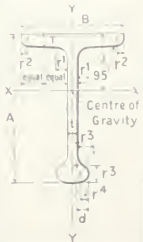
DIMENSIONS AND PROPERTIES.



Reference Mark	Size A × B	Standard Thickness t	Area square inches	Weight per foot—lbs.	Radii	
					r ¹	r ²
BSBA 20	12 × 4	600	10.724	36.46	.675	.450
19	11 × 3½	550	8.953	30.44	.625	.425
18	10 × 3½	525	7.504	26.37	.575	.400
17	9½ × 3½	500	7.277	24.74	.550	.375
16	9 × 3½	475	6.677	22.70	.550	.350
14	8½ × 3½	475	6.339	21.55	.525	.350
12	8 × 3½	450	5.779	19.65	.500	.325
11	8 × 3	425	5.301	18.02	.500	.325
9	7½ × 3	425	5.023	17.08	.475	.325
8	7 × 3½	425	4.940	16.80	.450	.300
7	7 × 3	400	4.498	15.29	.450	.300
6	6½ × 3½	400	4.420	15.03	.425	.275
5	6½ × 3	375	4.002	13.61	.425	.275
4	6 × 3	375	3.763	12.79	.400	.275
3	5 × 3	350	3.352	11.33	.375	.250

BULB TEES.

DIMENSIONS AND PROPERTIES.



Reference Mark	Size A × B	Standard Thickness		Area square inches	Weight per foot—lbs.	Radii	
		t	τ			r ¹	r ²
BSBT 6*	12 × 6	.575	.650	12.438	42.45	.975	.325
5*	11 × 6	.550	.600	11.136	37.86	.900	.300
4*	10 × 6	.500	.550	9.295	31.60	.825	.275
3*	9 × 5½	.475	.500	7.870	26.76	.750	.250
2*	8 × 5½	.450	.450	6.701	22.78	.675	.225
1*	7 × 5	.425	.425	5.592	19.01	.600	.200
DLBT 1A	2½ × 2½	.3125	.3125	1.759	5.98	.26	.14
1B	2 × 2	.2	.2	.941	3.20	.2	.1

The properties of British Standard Sections in above tables, where taken from the Engineering Standards Committee's Section Book, are published by permission of the Committee.

DORMAN, LONG & CO. LIMITED.

BULB ANGLES.

DIMENSIONS AND PROPERTIES.

Radii			Centre of Gravity		Moments of Inertia		Section Moduli		Angle of Gyration Degrees	Least Radius of Gyration Inches	Reference Mark
r'	r'	r	J	P	About xx	About yy	About xx	About yy			
1 125	675	550	5 535	772	191 443	8 355	29 843	2 593	4	821	BSBA 20
1 050	625	525	5 188	686	133 855	5 170	23 051	1 637	4	715	19
975	575	500	4 622	693	96 228	4 828	16 265	1 720	5	724	18
950	550	475	4 361	694	82 418	4 585	16 038	1 634	5	739	17
900	550	450	4 096	685	61 393	4 336	13 941	1 545	6	735	16
850	525	425	3 798	706	57 725	4 265	12 275	1 523	7	740	14
825	500	400	3 543	712	47 072	4 031	10 561	1 446	8	746	12
825	500	400	3 638	690	42 863	2 449	9 954	1 020	8	627	11
800	475	400	3 419	612	35 725	2 405	8 754	1 007	6	632	9
750	450	375	2 998	737	30 914	3 730	7 725	1 830	10	750	8
750	450	375	3 141	614	28 063	2 250	7 272	943	7	638	7
700	425	350	2 723	747	23 943	3 444	6 539	1 269	11	764	6
700	425	350	2 865	619	21 677	2 003	5 963	831	8	644	5
675	400	325	2 507	633	17 350	2 057	5 006	891	10	644	4
650	375	325	2 345	643	13 032	1 909	4 132	312	11	653	3

BULB TEES.

DIMENSIONS AND PROPERTIES.

Radii		Dimension d	Centre of Gravity J	Moments of Inertia		Section Moduli		Radii of Gyration Inches		Reference Mark
r'	r'			About xx	About yy	About xx	About yy	About xx	About yy	
1 30	475	725	4 759	236 608	13 965	32 704	4 297	4 353	1 687	BSBT 6*
1 20	450	675	4 290	177 041	12 690	26 324	3 406	3 983	1 067	5*
1 10	400	625	3 821	122 278	9 134	19 984	3 041	3 627	991	4*
1 00	375	575	3 524	83 730	6 410	15 290	2 331	3 262	902	3*
90	325	500	3 018	55 377	5 628	11 113	2 046	2 875	916	2*
80	300	450	2 611	35 027	4 021	7 994	1 608	2 505	846	1*
3	2	344	977	1 392	403	914	322	650	479	DLBT 1A
26	16	25	789	493	127	407	127	724	367	1B

The properties of British Standard Sections in above tables, where taken from the Engineering Standards Committee's Section Book, are published by permission of the Committee

NOTES ON I BEAMS AND COMPOUNDS.

Dimensions and Properties.—The dimensions and properties of I beams will be found on pages 34 and 35.

The dimensions and properties of compounds are given on the pages immediately preceding those containing the tabular loads for each type. The moment of inertia and section modulus have been calculated on the net section, that is both flanges holed for rivets, the size allowed in any particular case, being shown in the several tables.

Weight of Compounds.—The published weights per foot of compounds are inclusive of rivets. The pitch of rivets for splices in general demand has been taken as the basis of calculation in all cases.

Tabular Loads.—The loads given in the tables include the weights of the girders themselves, and are based on an extreme fibre stress of 7.5 tons per square inch, being one-fourth of the average breaking stress. They are also calculated on the assumption that the girders receive the usual side support as in building work. For other cases, such as concentrated, eccentric, or live loads, special calculation is necessary.

The resistance of the web to shear or buckling has been taken as the limiting factor in deciding the maximum load for each section. These loads should not be exceeded when sections are used at less spans than those for which such values are given.

Deflection. Care should be taken in selecting beams and compounds that the deflection is not too great for the purpose for which they are to be employed. The zig-zag lines in the tables indicate the generally accepted limit of span to depth (20 to 1) for girders supporting plastered ceilings at full tabular loads.

NORMAN: LIVING AND DEAD

Deflected Compound: For a beam and compound of similar section throughout their lengths, the deflection is uniform, the neutral axis is fixed, the position of the axis of the beam is fixed by the conditions above is given the load, weight. If the beam is not fixed by the above, then the deflection will be fixed by the position of the beam.

Deflection of a Beam and Compound: It will be assumed that, in the table of deflected beam, the deflection is fixed by the above conditions, the beam is not fixed, but it must be assumed that the beam is not fixed by the above conditions, the beam is not fixed by the above conditions, the beam is not fixed by the above conditions.

It will be further assumed that, in the table of deflected beam, the deflection is fixed by the above conditions, the beam is not fixed, but it must be assumed that the beam is not fixed by the above conditions, the beam is not fixed by the above conditions, the beam is not fixed by the above conditions.

The table of deflected beam, the deflection is fixed by the above conditions, the beam is not fixed, but it must be assumed that the beam is not fixed by the above conditions, the beam is not fixed by the above conditions, the beam is not fixed by the above conditions.

Deflection of Compound: In the table of deflected beam, the deflection is fixed by the above conditions, the beam is not fixed, but it must be assumed that the beam is not fixed by the above conditions, the beam is not fixed by the above conditions, the beam is not fixed by the above conditions.

DORMAN, LONG & CO. LIMITED.

I BEAMS.

SAFE LOADS IN TONS UNIFORMLY DISTRIBUTED.

For dimensions and properties of sections see pages 34 and 35.

Size Inches	Weight per foot lbs	SPANS IN FEET								
		2	4	6	8	10	12	14	16	18
24 7	100					102	92	79	69	61
20 7	89				94	83	69	59	52	46
18 7	75				78	64	53	45	40	35
16 6	62			73	56	45	38	32	28	25
15 6	59			62	52	42	35	30	26	23
15 5	42			47	35	28	24	20	18	16
14 6	57			59	47	38	31	27	24	21
14 6	46			43	39	31	26	22	19	17
12 6	54		53	52	39	31	26	22	19	17
12 6	44			40	33	26	22	19	16	14
12 5	39		45	36	27	22	18	15	13	12
12 5	32		32	30	23	18	15	13	11	10
10 8	70			53	43	34	28	24	21	19
10 6	42			35	26	21	17	15	13	11
10 5	35		37	28	21	17	14	12	10	9.3
10 5	30		30	24	18	14	12	10	9	8
9 7	58		44	42	32	25	21	18	16	14
*9 3	21.5	26	22	15	11	9.0	7.5	6.4	5.6	5.0
9 4	21		22	15	11	9	7.5	6.4	5.6	5
8 6	35		31	23	17	14	11	9.8	8.6	7.7
8 5	28		25	18	14	11	9	8	7	6.2
8 4	25	27	23	16	12	9.4	7.8	6.7	5.9	5.2
8 4	18	19	17	11	8.7	7	5.8	5	4.3	3.8
7 4	16	15	14	9.4	7	5.6	4.7	4	3.5	3.1
6 5	25	22	18	12	9	7.3	6	5.2	4.5	4
6 4	20	20	14	9.6	7.2	5.8	4.8	4.1	3.6	3.2
6 3	16	18	11	7.3	5.4	4.4	3.6	3.1	2.7	2.4
6 3	12	14	8.4	5.6	4.2	3.4	2.8	2.4	2.1	1.9
*5 5	24		15	9.8	7.3	5.9	4.9	4.2	3.7	..
5 4	18	13	11.3	7.6	5.6	4.5	3.8	3.2	2.8	..
5 4	19	18	11	7.4	5.6	4.5	3.7	3.2	2.8	..
5 3	11	9.8	6.8	4.5	3.4	2.7	2.3	1.9	1.7	..
4 1	10		4.9	3.3	2.4	2.0	1.6	1.4	..	..
4 1	6.5	7	3.5	2.4	1.8	1.4	1.2	1	..	..
4 3	9.5		7.8	4.7	3.1	2.3	1.9	1.6	1.3	..
4 1	8		6.6	3.3	2.2	1.6	1.3	1.1	.95	..
4 1	5		4.6	2.3	1.5	1.1	.91	.76	.65	..
*3 3	8.5	5.3	3.2	2	1.6	1.2	1	.9	..	..
3 1	6	4.4	2.2	1.5	1.1	.88	.73	.63	..	..
3 1	4	2.8	1.4	.92	.6	.55	.46	.39	..	..

2. Materials and Methods

I

[illegible]

This illustration with perspective is entitled *Red Square, St. Petersburg, 1910*.

BORMAN, LONG & CO. LIMITED.

DIMENSIONS OF COMPOUND GIRDERS.

For sale distributed under the following pages



Reference Mark	COMPOSED OF			Dimensions in inches	
	Beams	No.	Size	Depth	Width
B.F. 1	24 x 7 x 100	4	12 x 12	26 1/2	12
2	20 x 7 x 80	4	12 x 12	22 1/2	12
3	24 x 7 x 100	2	12 x 12	25 1/2	12
4	18 x 7 x 75	4	12 x 12	20 1/2	12
5	18 x 7 x 75	4	10 x 12	20 1/2	10
6	20 x 7 x 80	2	12 x 12	21 1/2	12
7	18 x 6 x 62	4	10 x 12	18 1/2	10
8	18 x 6 x 62	4	10 x 12	17 1/2	10
9	18 x 7 x 75	2	12 x 12	19 1/2	12
10	18 x 6 x 62	4	10 x 12	18 1/2	10
11	18 x 7 x 75	2	10 x 12	19 1/2	10
12	18 x 6 x 62	4	10 x 12	17 1/2	10
13	14 x 6 x 52	4	9 x 12	16 1/2	9
14	14 x 6 x 52	4	9 x 12	16 1/2	9
15	12 x 6 x 42	4	9 x 12	14 1/2	9
16	12 x 6 x 42	2	10 x 12	17 1/2	10
17	12 x 6 x 42	2	9 x 12	17 1/2	9
18	12 x 6 x 42	4	9 x 12	14 1/2	9
19	10 x 6 x 32	4	9 x 12	12 1/2	9
20	15 x 5 x 42	2	9 x 12	16 1/2	9
21	14 x 6 x 40	2	9 x 12	16 1/2	9
22	10 x 6 x 42	4	9 x 12	12 1/2	9
23	15 x 5 x 42	2	9 x 12	16 1/2	9
24	14 x 6 x 40	2	9 x 12	16 1/2	9
25	12 x 6 x 44	2	9 x 12	18 1/2	9
26	12 x 6 x 44	2	9 x 12	18 1/2	9
27	10 x 6 x 42	2	9 x 12	14 1/2	9
28	10 x 6 x 42	2	9 x 12	14 1/2	9

DORMAN, LONG & CO. LIMITED

PROPERTIES OF COMPOUND GIRDERS.

For safe distributed loads see following pages.

PROPERTIES OF SECTION				Dis- tributed Loads inches	Minimum Spacing in feet for Flanges (in)			Refer- ence Mark
Area sq. inches	Weight per foot—lbs.	Moment of Inertia	Radius Modulus		2"	4"	6"	
40 40	905	50511	574 0	1	24	30		85 1
54 47	1095	54052	611 7	1	20	30		86 2
64 44	1350	64005	636 0	1	18	34		87 3
62 50	1381	65002	650 5	1	22	30		88 4
67 50	1600	67200	690 1	1	18	30		89 5
81 47	1462	70775	780 1	1	14	34		90 6
48 50	1561	66200	651 8	1	16	30		91 7
48 50	1461	66040	664 1	1	18	30		92 8
67 50	1500	69205	691 1	1	14	34		93 9
68 52	1560	70400	710 4	1	14	30		94 10
84 50	1450 5	80000	800 0	1	12	30		95 11
67 55	1380	77111	801 3	1	10	30		96 12
60 50	1360 5	76400	800 0	1	10	30		97 13
84 50	1210 5	72700	871 0	1	14	30		98 14
68 50	1330	76000	870 0	1	20	30		99 15
80 50	1070 5	74000	884 0	1	10	30		100 16
60 48	1050 5	73000	884 0	1	10	18		101 17
60 50	1450	70500	1400 0	1	10	30		102 18
64 55	1500	80000	1340 0	1	18	34		103 19
58 50	850 5	58000	1300 0	1	12	32		104 20
64 50	800 5	55000	1210 0	1	14	18		105 21
60 50	1090	60000	1130 0	1	10	30		106 22
61 55	740	50000	1080 0	1	10	18		107 23
66 50	700 5	49000	1070 0	1	12	14		108 24
64 48	640 5	46000	1060 0	1	12	32		109 25
61 50	700 5	49000	950 0	1	10	18		110 26
60 50	650 5	47000	880 0	1	12	32		111 27
61 50	740 5	41000	750 0	1	10	18		112 28

DORMAN, LONG & CO. LIMITED

COMPOUND GIRDERS

SAVE LOAD IN TONS UNIFORMLY DISTRIBUTED

For information and property questions see inside pages.

[illegible]

DIMENSIONS OF COMPOUND GIRDERS.

For fully-latticed girders see following page.



Actual Span	DIMENSIONS OF			Distance of Rivets Center	Distances to Center	
	Depth	Flt.	Web		Top Flt.	Bottom
15	34	1	100	4	10	10
16	34	1	100	4	10	10
17	34	1	100	4	10	10
18	34	1	100	4	10	10
19	34	1	100	4	10	10
20	34	1	100	4	10	10
21	34	1	100	4	10	10
22	34	1	100	4	10	10
23	34	1	100	4	10	10
24	34	1	100	4	10	10
25	34	1	100	4	10	10
26	34	1	100	4	10	10
27	34	1	100	4	10	10
28	34	1	100	4	10	10
29	34	1	100	4	10	10
30	34	1	100	4	10	10
31	34	1	100	4	10	10
32	34	1	100	4	10	10
33	34	1	100	4	10	10
34	34	1	100	4	10	10
35	34	1	100	4	10	10
36	34	1	100	4	10	10
37	34	1	100	4	10	10
38	34	1	100	4	10	10
39	34	1	100	4	10	10
40	34	1	100	4	10	10
41	34	1	100	4	10	10
42	34	1	100	4	10	10
43	34	1	100	4	10	10
44	34	1	100	4	10	10
45	34	1	100	4	10	10
46	34	1	100	4	10	10
47	34	1	100	4	10	10
48	34	1	100	4	10	10
49	34	1	100	4	10	10
50	34	1	100	4	10	10
51	34	1	100	4	10	10
52	34	1	100	4	10	10
53	34	1	100	4	10	10
54	34	1	100	4	10	10
55	34	1	100	4	10	10
56	34	1	100	4	10	10
57	34	1	100	4	10	10
58	34	1	100	4	10	10
59	34	1	100	4	10	10
60	34	1	100	4	10	10
61	34	1	100	4	10	10
62	34	1	100	4	10	10
63	34	1	100	4	10	10
64	34	1	100	4	10	10
65	34	1	100	4	10	10
66	34	1	100	4	10	10
67	34	1	100	4	10	10
68	34	1	100	4	10	10
69	34	1	100	4	10	10
70	34	1	100	4	10	10
71	34	1	100	4	10	10
72	34	1	100	4	10	10
73	34	1	100	4	10	10
74	34	1	100	4	10	10
75	34	1	100	4	10	10
76	34	1	100	4	10	10
77	34	1	100	4	10	10
78	34	1	100	4	10	10
79	34	1	100	4	10	10
80	34	1	100	4	10	10
81	34	1	100	4	10	10
82	34	1	100	4	10	10
83	34	1	100	4	10	10
84	34	1	100	4	10	10
85	34	1	100	4	10	10
86	34	1	100	4	10	10
87	34	1	100	4	10	10
88	34	1	100	4	10	10
89	34	1	100	4	10	10
90	34	1	100	4	10	10
91	34	1	100	4	10	10
92	34	1	100	4	10	10
93	34	1	100	4	10	10
94	34	1	100	4	10	10
95	34	1	100	4	10	10
96	34	1	100	4	10	10
97	34	1	100	4	10	10
98	34	1	100	4	10	10
99	34	1	100	4	10	10
100	34	1	100	4	10	10

BERNARD, FISKE & CO. LIMITED

PROPERTIES OF COMPOUND GIRDERS

See also Appendix Table on following page

INFORMATION ON SECTION				No. of Rivets in Joints	Resistance to Tension		Weight per Foot	Safe Load Per Foot
Area of Section	Weight per Foot - lb.	Radius of Gyration	Section Modulus		A	A'		
1.00 00	1000 0	1.000	1.000 0	1			100	100
1.10 00	1100 0	1.100	1.100 0	1			110	110
1.20 00	1200 0	1.200	1.200 0	1			120	120
1.30 00	1300 0	1.300	1.300 0	1			130	130
1.40 00	1400 0	1.400	1.400 0	1			140	140
1.50 00	1500 0	1.500	1.500 0	1			150	150
1.60 00	1600 0	1.600	1.600 0	1			160	160
1.70 00	1700 0	1.700	1.700 0	1			170	170
1.80 00	1800 0	1.800	1.800 0	1			180	180
1.90 00	1900 0	1.900	1.900 0	1			190	190
2.00 00	2000 0	2.000	2.000 0	1			200	200
2.10 00	2100 0	2.100	2.100 0	1			210	210
2.20 00	2200 0	2.200	2.200 0	1			220	220
2.30 00	2300 0	2.300	2.300 0	1			230	230
2.40 00	2400 0	2.400	2.400 0	1			240	240
2.50 00	2500 0	2.500	2.500 0	1			250	250
2.60 00	2600 0	2.600	2.600 0	1			260	260
2.70 00	2700 0	2.700	2.700 0	1			270	270
2.80 00	2800 0	2.800	2.800 0	1			280	280
2.90 00	2900 0	2.900	2.900 0	1			290	290
3.00 00	3000 0	3.000	3.000 0	1			300	300
3.10 00	3100 0	3.100	3.100 0	1			310	310
3.20 00	3200 0	3.200	3.200 0	1			320	320
3.30 00	3300 0	3.300	3.300 0	1			330	330
3.40 00	3400 0	3.400	3.400 0	1			340	340
3.50 00	3500 0	3.500	3.500 0	1			350	350
3.60 00	3600 0	3.600	3.600 0	1			360	360
3.70 00	3700 0	3.700	3.700 0	1			370	370
3.80 00	3800 0	3.800	3.800 0	1			380	380
3.90 00	3900 0	3.900	3.900 0	1			390	390
4.00 00	4000 0	4.000	4.000 0	1			400	400
4.10 00	4100 0	4.100	4.100 0	1			410	410
4.20 00	4200 0	4.200	4.200 0	1			420	420
4.30 00	4300 0	4.300	4.300 0	1			430	430
4.40 00	4400 0	4.400	4.400 0	1			440	440
4.50 00	4500 0	4.500	4.500 0	1			450	450
4.60 00	4600 0	4.600	4.600 0	1			460	460
4.70 00	4700 0	4.700	4.700 0	1			470	470
4.80 00	4800 0	4.800	4.800 0	1			480	480
4.90 00	4900 0	4.900	4.900 0	1			490	490
5.00 00	5000 0	5.000	5.000 0	1			500	500
5.10 00	5100 0	5.100	5.100 0	1			510	510
5.20 00	5200 0	5.200	5.200 0	1			520	520
5.30 00	5300 0	5.300	5.300 0	1			530	530
5.40 00	5400 0	5.400	5.400 0	1			540	540
5.50 00	5500 0	5.500	5.500 0	1			550	550
5.60 00	5600 0	5.600	5.600 0	1			560	560
5.70 00	5700 0	5.700	5.700 0	1			570	570
5.80 00	5800 0	5.800	5.800 0	1			580	580
5.90 00	5900 0	5.900	5.900 0	1			590	590
6.00 00	6000 0	6.000	6.000 0	1			600	600
6.10 00	6100 0	6.100	6.100 0	1			610	610
6.20 00	6200 0	6.200	6.200 0	1			620	620
6.30 00	6300 0	6.300	6.300 0	1			630	630
6.40 00	6400 0	6.400	6.400 0	1			640	640
6.50 00	6500 0	6.500	6.500 0	1			650	650
6.60 00	6600 0	6.600	6.600 0	1			660	660
6.70 00	6700 0	6.700	6.700 0	1			670	670
6.80 00	6800 0	6.800	6.800 0	1			680	680
6.90 00	6900 0	6.900	6.900 0	1			690	690
7.00 00	7000 0	7.000	7.000 0	1			700	700
7.10 00	7100 0	7.100	7.100 0	1			710	710
7.20 00	7200 0	7.200	7.200 0	1			720	720
7.30 00	7300 0	7.300	7.300 0	1			730	730
7.40 00	7400 0	7.400	7.400 0	1			740	740
7.50 00	7500 0	7.500	7.500 0	1			750	750
7.60 00	7600 0	7.600	7.600 0	1			760	760
7.70 00	7700 0	7.700	7.700 0	1			770	770
7.80 00	7800 0	7.800	7.800 0	1			780	780
7.90 00	7900 0	7.900	7.900 0	1			790	790
8.00 00	8000 0	8.000	8.000 0	1			800	800
8.10 00	8100 0	8.100	8.100 0	1			810	810
8.20 00	8200 0	8.200	8.200 0	1			820	820
8.30 00	8300 0	8.300	8.300 0	1			830	830
8.40 00	8400 0	8.400	8.400 0	1			840	840
8.50 00	8500 0	8.500	8.500 0	1			850	850
8.60 00	8600 0	8.600	8.600 0	1			860	860
8.70 00	8700 0	8.700	8.700 0	1			870	870
8.80 00	8800 0	8.800	8.800 0	1			880	880
8.90 00	8900 0	8.900	8.900 0	1			890	890
9.00 00	9000 0	9.000	9.000 0	1			900	900
9.10 00	9100 0	9.100	9.100 0	1			910	910
9.20 00	9200 0	9.200	9.200 0	1			920	920
9.30 00	9300 0	9.300	9.300 0	1			930	930
9.40 00	9400 0	9.400	9.400 0	1			940	940
9.50 00	9500 0	9.500	9.500 0	1			950	950
9.60 00	9600 0	9.600	9.600 0	1			960	960
9.70 00	9700 0	9.700	9.700 0	1			970	970
9.80 00	9800 0	9.800	9.800 0	1			980	980
9.90 00	9900 0	9.900	9.900 0	1			990	990
10.00 00	10000 0	10.000	10.000 0	1			1000	1000

DORMAN, LONG & CO. LIMITED.



COMPOUND GIRDERS.



SAFE LOAD IN TONS UNIFORMLY DISTRIBUTED

For dimensions and properties of sections see preceding pages.

Reference Mark	SPANS IN FEET											
	8	10	12	14	16	18	20	22	24	26	28	30
BC29										204	192	180
30									204	190	176	164
31								188	180	166	154	144
32							204	193	177	163	151	141
33							188	179	164	152	141	131
34						204	197	179	164	151	141	131
35								156	154	142	132	123
36					188	187	168	153	140	129	120	112
37					188	173	156	142	130	120	111	104
38				204	194	173	156	142	130	120	111	104
39				204	185	164	148	135	123	114	106	99
40						156	141	128	118	109	101	94
41					156	144	130	118	108	100	93	87
42			188	173	152	135	121	110	101	93	87	81
43					146	132	119	108	99	92	85	79
44			188	164	144	128	115	105	96	89	82	77
45					124	123	111	101	92	85	79	74
46				146	134	119	107	97	89	82	76	71
47				146	132	117	106	96	88	81	75	70
48	253	202	168	144	126	112	101	92	84	78	72	67
49			156	141	123	110	99	90	82	76	71	66
50			146	136	119	108	96	87	80	74	68	64
51		156	155	133	116	103	93	85	78	72	66	62
52	210	168	140	120	105	93	84	76	70	65	60	56
53					86	85	77	70	64	59	55	51
54		145	121	104	91	81	72	66	60	56	52	48
55	146	145	121	103	90	80	72	66	60	55	51	48
56	146	135	112	96	84	75	67	61	56	52	48	45
57				86	83	74	67	61	56	52	48	45
58		130	108	93	81	72	65	59	54	50	46	43
59			94	87	76	68	61	56	51	47	44	41
60		94	87	74	65	58	52	47	43	40	37	35
61			86	74	65	58	52	47	43	40	37	35
62		96	80	69	60	53	48	44	40	37	34	31
63	113	90	75	64	56	50	45	41	38	35	32	30
64	94	86	71	61	54	48	43	39	36	33	31	29
65		79	65	56	49	44	39	36	33	30	28	26
66			60	53	46	41	37	33	31	28	26	24
67			60	51	45	40	36	33	30	27	25	23
68	64	61	51	43	38	34	30	27	25	23	21	19
69		51	43	37	32	29	26	23	21	19	17	15
70	60	49	41	35	31	27	24	22	20	18	16	14

DORMAN, LONG & CO. LIMITED.

DIMENSIONS OF COMPOUND GIRDERS.

For safe distributed loads see following pages.



Reference Mark	COMPOSED OF					Centres of Beams inches	Dimensions in inches	
	Beams		Flats		Depth		Width	
			No	Size				
BC 71	24	7	100	6	24	7	27	24
" 72	24	7	100	6	24	7	27	24
" 73	20	7	89	6	24	7	23	24
" 74	24	7	100	4	24	7	26	24
" 75	24	7	100	4	24	7	26	24
" 76	20	7	89	6	24	7	23	24
" 77	18	7	75	6	24	7	21	24
" 78	24	7	100	2	24	7	25	24
" 79	20	7	89	4	24	7	22	24
" 80	24	7	100	2	24	7	25	24
" 81	18	7	75	6	24	7	21	24
" 82	20	7	89	4	24	7	22	24
" 83	18	7	75	4	24	7	20	24
" 84	20	7	89	2	24	7	21	24
" 85	16	6	62	6	20	6	19	20
" 86	18	7	75	4	24	7	20	24
" 87	20	7	89	2	24	7	21	24
" 88	16	6	62	6	20	6	19	20
" 89	18	7	75	2	24	7	19	24
" 90	18	7	75	2	24	7	19	24
" 91	16	6	62	4	20	6	18	20
" 92	16	6	62	4	20	6	18	20
" 93	14	6	46	4	20	6	16	20
" 94	15	5	42	4	18	6	17	18
" 95	16	6	62	2	20	6	17	20
" 96	14	6	46	4	20	6	16	20
" 97	15	5	42	4	18	6	17	18
" 98	16	6	62	2	20	6	17	20
" 99	14	6	46	2	20	6	15	20
" 100	15	5	42	2	18	6	16	18
" 101	14	6	46	2	20	6	15	20
" 102	15	5	42	2	18	6	16	18

DORMAN, LONG & CO. LIMITED

PROPERTIES OF COMPOUND GIRDERS.

For safe distributed loads see following pages

PROPERTIES OF SECTION				Dia- meter of Rivets inches	Minimum Spans in feet for Pitches (p)			Refer- ence Mark
Area sq. inches	Weight per foot lbs.	Moment of Inertia	Section Modulus		3	4	6	
178 20	615 5	20526	1479 3		24	28		B6 71
160 20	564	17945	1299 6			20		72
168 51	582 6	14051	1183 2		20	20		73
148 20	510 5	15647	1180 9			18	24	74
136 20	469 5	13921	1063 1			16	22	75
150 51	521	11877	1032 7		16	22		76
156 18	540 5	10953	1007 1		20	24		77
124 20	428 5	12063	946 1			14	16	78
138 51	480 5	10504	933 7		16	18	24	79
118 20	408 5	11210	887 2			14	16	80
138 18	479	9133	869 8		18	22		81
126 51	436 5	9191	835 6			14	22	82
126 18	438 5	7991	779 6			16	20	83
114 51	395 5	7937	738 3			12	18	84
129 69	450 5	7085	717 4		16	22		85
114 18	394 5	6903	690 3			14	22	86
108 51	375 5	7332	690			12	14	87
114 69	399 5	5872	618		14	20		88
102 18	353 5	5870	602			12	18	89
96 18	333 5	5372	558 1			10	16	90
104 69	365 5	5115	552 9		12	16	22	91
94 69	328 5	4398	488 6		10	14	18	92
90 59	314 5	3660	443 6			16	22	93
82 05	285	3698	422 7		14	20	28	94
79 69	277 5	3395	393 6			8	14	95
80 59	280 5	3091	386 4			14	18	96
73 05	254 5	3119	366 9		12	16	22	97
74 69	280 5	3080	362 3			8	12	98
65 59	229 5	2303	302			10	14	99
59 55	206 5	2311	284 4			10	16	100
60 59	212 5	2057	274 3			10	12	101
55 05	191	2058	257 2			8	14	102

DORMAN, LONG & CO. LIMITED.



COMPOUND GIRDERS.



SAFE LOAD IN TONS UNIFORMLY DISTRIBUTED

For dimensions and properties of sections see preceding pages.

Reference Mark	SPANS IN FEET												
	8	10	12	14	16	18	20	22	24	26	28	30	
BC 71									300	285	264	247	
72							306	295	271	250	232	217	
73							282	269	247	228	211	197	
74						306	295	268	246	227	211	197	
75					306	295	266	242	222	205	190	177	
76						282	258	235	216	199	184	172	
77							334	229	210	194	180	168	
78			306	296	263	237	215	197	182	169	158		
79				282	269	235	212	195	180	167	156		
80			306	277	247	222	202	185	171	159	148		
81						234	218	198	181	167	155	145	
82			382	261	232	209	190	174	161	149	139		
83				234	217	195	177	162	150	139	130		
84			282	264	231	205	185	168	154	142	132	123	
85					219	199	179	163	150	138	128	120	
86				234	216	192	173	157	144	133	123	115	
87			282	246	216	192	173	157	144	133	123	115	
88				219	193	172	155	141	129	119	110	103	
89			234	215	188	167	151	137	125	116	108	100	
90		234	233	199	174	156	140	127	116	107	100	93	
91			219	197	173	154	138	126	115	106	99	92	
92		219	204	175	153	136	122	111	102	94	87	81	
93					129	123	111	101	92	85	79	74	
94				141	132	117	106	96	88	81	75	70	
95	219	197	164	141	123	109	98	90	82	76	70	66	
96				129	121	107	97	88	81	74	69	64	
97			141	131	115	102	92	83	76	71	66	61	
98	219	181	151	129	113	101	91	82	75	70	65	61	
99		129	126	108	94	84	75	69	63	58	54	50	
100		141	119	102	89	79	71	65	59	55	51	47	
101		129	114	98	86	76	69	62	57	53	49	46	
102	141	128	107	92	80	71	64	59	54	50	46	43	

DORMAN, LONG & CO. LIMITED



COMPOUND GIRDERS



SAFE LOAD IN TONS UNIFORMLY DISTRIBUTED



For dimensions and properties of sections see preceding pages

[illegible]

DORMAN, LONG & CO. LIMITED.

DIMENSIONS OF COMPOUND GIRDERS.

For safe distributed loads see following pages.

	Refer- ence Mark	COMPOSED OF				Dimen- sion D inches	Dimensions in inches	
		Channels	Flats		Depth		Width	
			No	Size				
 	00 103	15 x 4	41' 94	4	14	5 1/2	17	14
	104	15 x 4	41' 94	4	14	5 1/2	17	14
	105	12 x 3 1/2	26' 1	4	14	6 1/2	14	14
	106	15 x 4	41' 94	2	14	5 1/2	16 1/4	14
	107	12 x 3 1/2	26' 1	4	14	6 1/2	14	14
	108	15 x 4	41' 94	2	14	5 1/2	16	14
	109	10 x 3 1/2	23' 55	4	14	6 1/2	12	14
	110	10 x 3 1/2	23' 55	4	12	4 1/2	12	12
	111	12 x 3 1/2	26' 1	2	14	6 1/2	13 1/4	14
	112	9 x 3	19' 37	4	12	5 1/2	11	12
	113	10 x 3 1/2	23' 55	2	14	6 1/2	11 1/4	14
	114	12 x 3 1/2	26' 1	2	12	4 1/2	13	12
	115	9 x 3	19' 37	4	10	3 1/2	11	10
	116	10 x 3 1/2	23' 55	2	12	4 1/2	11	12
	117	9 x 3	19' 37	2	12	5 1/2	10 1/4	12
	118	9 x 3	19' 37	2	10	3 1/2	10	10

PROPERTIES OF COMPOUND GIRDERS

For use in reinforced concrete floor slabs

PROPERTIES OF SECTION				Ratio of Depth to Width	Ratio of Area of Steel to Concrete			Ratio of Strength
Area of Steel	Weight per Sq. Ft.	Area of Concrete	Area of Steel		1	2	3	
10.00	10.00	10.00	10.00	1	10	10	10	10.00
12.00	12.00	12.00	12.00	1	12	12	12	12.00
14.00	14.00	14.00	14.00	1	14	14	14	14.00
16.00	16.00	16.00	16.00	1	16	16	16	16.00
18.00	18.00	18.00	18.00	1	18	18	18	18.00
20.00	20.00	20.00	20.00	1	20	20	20	20.00
22.00	22.00	22.00	22.00	1	22	22	22	22.00
24.00	24.00	24.00	24.00	1	24	24	24	24.00
26.00	26.00	26.00	26.00	1	26	26	26	26.00
28.00	28.00	28.00	28.00	1	28	28	28	28.00
30.00	30.00	30.00	30.00	1	30	30	30	30.00
32.00	32.00	32.00	32.00	1	32	32	32	32.00
34.00	34.00	34.00	34.00	1	34	34	34	34.00
36.00	36.00	36.00	36.00	1	36	36	36	36.00
38.00	38.00	38.00	38.00	1	38	38	38	38.00
40.00	40.00	40.00	40.00	1	40	40	40	40.00
42.00	42.00	42.00	42.00	1	42	42	42	42.00
44.00	44.00	44.00	44.00	1	44	44	44	44.00
46.00	46.00	46.00	46.00	1	46	46	46	46.00
48.00	48.00	48.00	48.00	1	48	48	48	48.00
50.00	50.00	50.00	50.00	1	50	50	50	50.00
52.00	52.00	52.00	52.00	1	52	52	52	52.00
54.00	54.00	54.00	54.00	1	54	54	54	54.00
56.00	56.00	56.00	56.00	1	56	56	56	56.00
58.00	58.00	58.00	58.00	1	58	58	58	58.00
60.00	60.00	60.00	60.00	1	60	60	60	60.00
62.00	62.00	62.00	62.00	1	62	62	62	62.00
64.00	64.00	64.00	64.00	1	64	64	64	64.00
66.00	66.00	66.00	66.00	1	66	66	66	66.00
68.00	68.00	68.00	68.00	1	68	68	68	68.00
70.00	70.00	70.00	70.00	1	70	70	70	70.00

DORMAN, LONG & CO. LIMITED.



COMPOUND GIRDERS.



SAFE LOAD IN TONS UNIFORMLY DISTRIBUTED.

For dimensions and properties of sections see preceding pages.

Reference Mark	SPANS IN FEET											
	8	10	12	14	16	18	20	22	24	26	28	30
CC 103		129	126	108	94	84	75	68	63	58	54	50
104		129	107	92	80	71	64	58	53	49	46	43
105				72	70	62	56	51	47	43	40	
106	120	96	80	68	60	53	48	44	40	37	34	32
107			71	67	59	52	47	43	39	36	33	
108	106	85	71	61	53	47	43	39	36	33	30	28
109			63	55	48	43	38	35	32			
110		63	55	47	42	37	33	30	28			
111	71	66	55	47	42	37	33	30	28	26		
112	69	66	47	41	36	32	28	26				
113	63	54	46	39	34	30	27	24				
114	64	51	43	37	32	29	26	23	21	20		
115	69	48	40	34	30	27	25	22				
116	52	41	35	30	26	23	21	19				
117	49	40	33	28	25	22	20					
118	30	29	25	21	18	16	14					

STANCHIONS AND STRUTS.

Crippling Loads for various values of $\frac{l}{r}$.—A table shewing the crippling loads, in tons per square inch, on stanchions and struts, for various values of $\frac{l}{r}$ up to 200, is given on page 68.

Tabular Loads. The safe loads given in the tables are based on the crippling values above referred to, for the least radius of gyration for each section; the factor of safety adopted being 4. They are for stanchions or struts the ends of which may be considered fixed, and only apply to static and concentric loading.

In preparing the table of safe loads on latticed channel stanchions, it has been assumed that the channels are efficiently connected together by lattice bars or bracing plates, so that they act as a unit, thus eliminating all possibility of failure by local flexure of either channel.

Effective length.—In stanchions or struts having intermediate steelwork connections, so arranged as to prevent side flexure where these connections occur, the effect is such that the load transmitted may be considered as acting on the shortened length, and the section determined accordingly.

Limiting lengths for Tabular Loads.—The maximum lengths for which loads are given are based on the lesser of the two values:

- I.—160 times the least radius of gyration.
- II.—40 times the least width of the section.

Selection of Stanchions.—It will be observed that, in each stanchion table, the sections are arranged in order of their carrying capacity, thus affording a ready means of selection according to requirements.

HOWARD, LOUIS A. and LINDSEY

Tissue Weight of Muscles. The weight given to the tissue directly beneath the test foot, measured at various intervals of exercise, begins to approximate being twice as heavy for maintaining all work.

This weight of tissue may vary slightly as indicated in this found in the test and record of exercise.

Proportion of Sediment. The weight of sediment may vary with the weight of the tissue, but the weight of sediment is not in proportion to the weight of the tissue. The weight of the sediment is not in proportion to the weight of the tissue. The weight of the sediment is not in proportion to the weight of the tissue. The weight of the sediment is not in proportion to the weight of the tissue.

Condition of Tissue. It is not possible to measure the condition of the tissue at the time of the test.

In the case of the test of the tissue, the condition of the tissue is not in proportion to the weight of the tissue. The condition of the tissue is not in proportion to the weight of the tissue. The condition of the tissue is not in proportion to the weight of the tissue.

Results of the test of the tissue, the condition of the tissue is not in proportion to the weight of the tissue. The condition of the tissue is not in proportion to the weight of the tissue. The condition of the tissue is not in proportion to the weight of the tissue.

Type of Work, Cuts, Joints, and Other Conditions in Muscles. The type of work, cuts, joints, and other conditions in muscles are not in proportion to the weight of the tissue. The type of work, cuts, joints, and other conditions in muscles are not in proportion to the weight of the tissue.

Beam Grillages for Stanchions.—For stanchions carrying heavy loads, the necessity for deep excavations and large masses of masonry in foundations, may be considerably reduced by the adoption of suitable grillages, combined with stanchion bases, carefully designed to transmit the load.

These are generally obtained by placing on a layer of concrete, one, two, or three tiers of I beams, according to the load to be distributed, and the bearing capacity of the ground. The beams in each tier should be kept sufficiently far apart to allow of the space being thoroughly filled with concrete. Cast iron separators, with through bolts, are generally employed to effect this. In cases where two or three tiers are found necessary, they should be efficiently secured to each other, and the stanchion base to the whole.

The following diagram illustrates a grillage, consisting of two tiers of beams:—



DOUGLASS, LONG & CO. LIMITED.

The overall dimensions of the lattice pier are determined by the bearing capacity of the ground, and to find the section of beams required in any pier.

Let W = total load or tons supported by the struts.

n = number of beams forming the pier.

w = load in tons supported by one beam = $\frac{W}{n}$.

L = length in feet of each beam.

l = length in feet, or vertical portion of beam, on which the load above it is distributed.

M = maximum bending moment in foot tons, in one beam (this occurs at the centre of length L).

$$\text{then } M = \left(\frac{w}{2} - \frac{L}{4} \right) \left(\frac{w}{2} - \frac{l}{4} \right) - \frac{w}{8} (L - l)^2$$

The above bending moment is equivalent to that produced in a beam supported at both ends, and carrying a distributed load " w " over a span " $L - l$ ". Therefore, on reference to the span in the tables of safe loads, given on pages 46 and 47, the size of beam to carry the load w may be obtained direct.

It should be observed, however, that the numbers given on page 44, under the heading "tabular load," the load w should not exceed the maximum load given in the table, for the section determined upon.

EXAMPLE.—A girder has to be provided for a structure, on ground having a bearing capacity of 2 tons per square foot. The total load to be supported being 100 tons, assumed size of structural steel, 2 feet square.

For above load and bearing capacity of ground, two ties will suffice, and as the area required for the foundation is 50 square feet, the lowest ties

DORMAN, LONG & CO. LIMITED.

I BEAMS AS STANCHIONS.

DIMENSIONS AND PROPERTIES.



Reference Mark	Size inches	Area sq inches	Weight per foot lbs.	Radii of Gyration in inches	
				About xx	About yy
18 1	24 x 7 1/2	29.40	100	9.50	1.50
" 2	20 x 7 1/2	26.17	89	7.99	1.54
" 3	10 x 8	20.6	70	4.09	1.86
" 4	18 x 7	22.06	75	7.21	1.46
" 5	9 x 7	17.06	58	3.66	1.64
" 6	16 x 6	18.23	62	6.31	1.21
" 7	15 x 6	17.35	59	6.02	1.27
" 8	14 x 6	16.76	57	5.63	1.29
" 9	12 x 6	15.88	54	4.86	1.33
" 10	14 x 6	13.53	46	5.70	1.26
" 11	12 x 6	12.94	44	4.93	1.31
" 12	10 x 6	12.35	42	4.13	1.36
" 13	8 x 6	10.29	35	3.27	1.32
" 14	15 x 5	12.35	42	5.88	.978
" 15	12 x 5	11.47	39	4.77	1.03
" 16	10 x 5	10.29	35	4.03	1.07
" 17	12 x 5	9.41	32	4.83	1.01
" 18	10 x 5	8.82	30	4.06	1.05
" 19	8 x 5	8.24	28	3.29	1.11
" 20	6 x 5	7.35	25	2.43	1.11
" 21	6 x 4 1/2	5.88	20	2.42	.959
" 22	5 x 4 1/2	5.29	18	2.07	1.03
" 23	9 x 4	6.176	21	3.62	.824
" 24	8 x 4	5.294	18	3.24	.822
" 25	7 x 4	4.706	16	2.88	.851

I BEAMS AS STANCHIONS.

SAFE LOAD IN TONS.

ENDS FIXED.

(For other conditions of ends see page 69.)

SAFE LOAD IN TONS FOR

LENGTHS OF BEAM

W	8	10	12	14	16	18	20	22	24	Safe Load
104	124	143	160	177	193	21	18			18 1/2
108	130	150	168	185	201	22	19			19 1/2
112	137	157	175	192	208	23	20	22	24	20 1/2
116	143	164	182	199	215	24	21			21 1/2
120	149	170	188	205	221	25	22			22 1/2
124	155	176	194	211	227	26	23			23 1/2
128	161	182	200	217	233	27	24			24 1/2
132	167	188	206	223	239	28	25			25 1/2
136	173	194	212	229	245	29	26			26 1/2
140	179	200	218	235	251	30	27			27 1/2
144	185	206	224	241	257	31	28			28 1/2
148	191	212	230	247	263	32	29			29 1/2
152	197	218	236	253	269	33	30			30 1/2
156	203	224	242	259	275	34	31			31 1/2
160	209	230	248	265	281	35	32			32 1/2
164	215	236	254	271	287	36	33			33 1/2
168	221	242	260	277	293	37	34			34 1/2
172	227	248	266	283	299	38	35			35 1/2
176	233	254	272	289	305	39	36			36 1/2
180	239	260	278	295	311	40	37			37 1/2
184	245	266	284	301	317	41	38			38 1/2
188	251	272	290	307	323	42	39			39 1/2
192	257	278	296	313	329	43	40			40 1/2
196	263	284	302	319	335	44	41			41 1/2
200	269	290	308	325	341	45	42			42 1/2
204	275	296	314	331	347	46	43			43 1/2
208	281	302	320	337	353	47	44			44 1/2
212	287	308	326	343	359	48	45			45 1/2
216	293	314	332	349	365	49	46			46 1/2
220	299	320	338	355	371	50	47			47 1/2
224	305	326	344	361	377	51	48			48 1/2
228	311	332	350	367	383	52	49			49 1/2
232	317	338	356	373	389	53	50			50 1/2
236	323	344	362	379	395	54	51			51 1/2
240	329	350	368	385	401	55	52			52 1/2
244	335	356	374	391	407	56	53			53 1/2
248	341	362	380	397	413	57	54			54 1/2
252	347	368	386	403	419	58	55			55 1/2
256	353	374	392	409	425	59	56			56 1/2
260	359	380	398	415	431	60	57			57 1/2
264	365	386	404	421	437	61	58			58 1/2
268	371	392	410	427	443	62	59			59 1/2
272	377	398	416	433	449	63	60			60 1/2
276	383	404	422	439	455	64	61			61 1/2
280	389	410	428	445	461	65	62			62 1/2
284	395	416	434	451	467	66	63			63 1/2
288	401	422	440	457	473	67	64			64 1/2
292	407	428	446	463	479	68	65			65 1/2
296	413	434	452	469	485	69	66			66 1/2
300	419	440	458	475	491	70	67			67 1/2

ANALYSIS OF VARIANCE
SUMMARY OF RESULTS

Source of Variation	Sum of Squares	D.F.	Mean Square	F	P
Between Groups	10.12	1	10.12	1.12	0.30
Within Groups	10.12	1	10.12	1.12	0.30
Total	20.24	2	10.12	1.12	0.30



DORMAN, LONG & CO. LIMITED.

COMPOUND STANCHIONS.

SAFE LOADS IN TONS.

ENDS FIXED.

For other conditions of ends see page 65.

SAFE LOADS IN TONS FOR

LENGTHS IN FEET

8	10	12	14	16	18	20	22	24	26	28	30	32	34	Reference Mark
252	245	236	225	214	202	188	173	159	145	133	122			15 26
234	228	220	211	201	190	178	165	151	139	128	118	108		27
211	206	199	191	182	173	162	151	139	128	118	108	100		28
190	185	179	172	164	156	147	137	126	116	107	98	91		29
185	181	175	168	161	153	144	135	125	115	106	98	90		30
182	177	172	165	158	151	142	132	123	114	105	97	90	83	31
177	173	168	162	155	148	140	131	122	112	104	96	89	82	32
187	182	175	167	158	148	138	126	116	106	97	88			33
172	167	161	154	146	138	129	119	109	100	92	84			34
164	160	156	150	144	138	131	123	115	107	99	91	84	78	35
161	157	153	148	142	136	129	122	114	106	98	91	84	78	36
167	163	157	150	143	135	127	117	108	99	91	84	77		37
157	154	150	145	139	133	127	120	112	104	97	90	83	77	38
164	160	154	148	141	133	125	116	107	99	91	83	77		39
167	162	155	148	140	131	121	111	101	92	84	77			40
159	155	150	144	138	131	123	114	105	97	90	83	76		41
158	152	145	137	128	118	107	97	88	79					42
146	142	138	133	127	121	114	107	99	91	84	78	72		43
143	139	135	130	125	119	112	105	98	90	83	77	71	66	44
140	136	132	128	123	117	111	104	97	90	83	77	71	66	45
135	131	125	119	112	104	96	87	80	73	66				46
121	116	110	104	98	90	82	74	67	61					47
120	115	109	103	96	88	79	72	65	59					48
109	106	101	96	90	84	77	70	64	58	53				49
109	105	100	95	89	82	75	68	62	56	51				50
108	103	98	92	86	78	71	64	58	52					51
103	98	92	86	78	70	63	56	50						52
96	92	87	82	77	70	63	57	52	47					53
92	87	81	75	67	60	53	48							54

DORMAN, LONG & CO. LIMITED.

COMPOUND STANCHIONS.

DIMENSIONS AND PROPERTIES.

Reference Mark	COMPOSED OF				Dimen- sions in inches		Area square inches	Weight per foot - lbs.	Radii of Gyratlon in inches			
	Beams		Flats		Depth	Width			About x x	About y y		
IS 55	24	7	100	14	26	14	64'40	223	11'31	3'14		
56	20	7	89	14	22	14	61'17	212	9'59	3'22		
57	18	7	75	14	20	14	57'06	198	8'77	3'29		
58	10	8	70	14	12	14	55'60	193	5'11	3'40		
59	24	7	100	14	26	14	57'40	199'5	11'07	3'02		
" 60	20	7	89	14	22	14	54'17	188'5	9'37	3'10		
" 61	18	7	75	14	20	14	50'06	174'5	8'57	3'17		
" 62	10	8	70	14	12	14	48'60	169'5	4'95	3'29		
" 63	16	6	62	12	18	12	48'23	168	7'83	2'83		
" 64	15	6	59	12	17	12	47'35	165	7'42	2'86		
" 65	14	6	57	12	16	12	46'76	163	6'98	2'88		
" 66	12	6	54	12	14	12	45'88	158'5	6'07	2'90		
" 67	10	8	70	10	12	10	45'60	159	4'99	2'47		
" 68	16	6	62	12	18	12	42'23	147'5	7'63	2'73		
" 69	15	6	59	12	17	12	41'35	144'5	7'23	2'76		
" 70	14	6	57	12	16	12	40'76	142'5	6'80	2'78		
" 71	12	6	54	12	14	12	39'88	138'5	5'90	2'81		
" 72	9	7	58	10	11	10	42'06	147	4'60	2'46		
" 73	10	8	70	10	12	10	40'60	142	4'80	2'42		
" 74	10	6	42	12	12	12	36'35	126'5	5'08	2'92		
" 75	9	7	58	9	11	9	39'56	138'5	4'56	2'23		
" 76	9	7	58	9	11	9	35'06	123'5	4'40	2'18		
" 77	10	5	35	8	12	8	30'29	105'5	5'15	1'98		
" 78	8	6	35	9	10	9	28'29	99	4'10	2'22		
" 79	10	5	30	8	12	8	24'82	87	5'04	1'95		



DORMAN, LYNCH & CO., LIMITED.

COMPOUND STANCHIONS.

SAFE LOADS IN TONS.

ENDS FIXED.

Please refer to conditions of order and page 66.

SAFE LOADS IN TONS PER

LENGTH IN FEET

Length in Feet	Length in Feet														Safe Load in Tons per Foot
	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
574	300	301	302	303	304	305	306	307	308	309	310	311	312	313	17.5
586	310	311	312	313	314	315	316	317	318	319	320	321	322	323	17.6
598	320	321	322	323	324	325	326	327	328	329	330	331	332	333	17.7
610	330	331	332	333	334	335	336	337	338	339	340	341	342	343	17.8
622	340	341	342	343	344	345	346	347	348	349	350	351	352	353	17.9
634	350	351	352	353	354	355	356	357	358	359	360	361	362	363	18.0
646	360	361	362	363	364	365	366	367	368	369	370	371	372	373	18.1
658	370	371	372	373	374	375	376	377	378	379	380	381	382	383	18.2
670	380	381	382	383	384	385	386	387	388	389	390	391	392	393	18.3
682	390	391	392	393	394	395	396	397	398	399	400	401	402	403	18.4
694	400	401	402	403	404	405	406	407	408	409	410	411	412	413	18.5
706	410	411	412	413	414	415	416	417	418	419	420	421	422	423	18.6
718	420	421	422	423	424	425	426	427	428	429	430	431	432	433	18.7
730	430	431	432	433	434	435	436	437	438	439	440	441	442	443	18.8
742	440	441	442	443	444	445	446	447	448	449	450	451	452	453	18.9
754	450	451	452	453	454	455	456	457	458	459	460	461	462	463	19.0
766	460	461	462	463	464	465	466	467	468	469	470	471	472	473	19.1
778	470	471	472	473	474	475	476	477	478	479	480	481	482	483	19.2
790	480	481	482	483	484	485	486	487	488	489	490	491	492	493	19.3
802	490	491	492	493	494	495	496	497	498	499	500	501	502	503	19.4
814	500	501	502	503	504	505	506	507	508	509	510	511	512	513	19.5
826	510	511	512	513	514	515	516	517	518	519	520	521	522	523	19.6
838	520	521	522	523	524	525	526	527	528	529	530	531	532	533	19.7
850	530	531	532	533	534	535	536	537	538	539	540	541	542	543	19.8
862	540	541	542	543	544	545	546	547	548	549	550	551	552	553	19.9
874	550	551	552	553	554	555	556	557	558	559	560	561	562	563	20.0
886	560	561	562	563	564	565	566	567	568	569	570	571	572	573	20.1
898	570	571	572	573	574	575	576	577	578	579	580	581	582	583	20.2
910	580	581	582	583	584	585	586	587	588	589	590	591	592	593	20.3
922	590	591	592	593	594	595	596	597	598	599	600	601	602	603	20.4
934	600	601	602	603	604	605	606	607	608	609	610	611	612	613	20.5
946	610	611	612	613	614	615	616	617	618	619	620	621	622	623	20.6
958	620	621	622	623	624	625	626	627	628	629	630	631	632	633	20.7
970	630	631	632	633	634	635	636	637	638	639	640	641	642	643	20.8
982	640	641	642	643	644	645	646	647	648	649	650	651	652	653	20.9
994	650	651	652	653	654	655	656	657	658	659	660	661	662	663	21.0
1006	660	661	662	663	664	665	666	667	668	669	670	671	672	673	21.1
1018	670	671	672	673	674	675	676	677	678	679	680	681	682	683	21.2
1030	680	681	682	683	684	685	686	687	688	689	690	691	692	693	21.3
1042	690	691	692	693	694	695	696	697	698	699	700	701	702	703	21.4
1054	700	701	702	703	704	705	706	707	708	709	710	711	712	713	21.5
1066	710	711	712	713	714	715	716	717	718	719	720	721	722	723	21.6
1078	720	721	722	723	724	725	726	727	728	729	730	731	732	733	21.7
1090	730	731	732	733	734	735	736	737	738	739	740	741	742	743	21.8
1102	740	741	742	743	744	745	746	747	748	749	750	751	752	753	21.9
1114	750	751	752	753	754	755	756	757	758	759	760	761	762	763	22.0

DORMAN, LONG & CO. LIMITED.

COMPOUND STANCHIONS.

DIMENSIONS AND PROPERTIES.

Reference Mark	COMPOSED OF		Centres of Beams	Dimen- sions in inches		Area Square Inches	Weight per foot—lbs.	Radii of Gyration in inches	
	Beams	Flats		Depth	Width			About xx	About yy
IS	80	24 7	100 18	9	25 18	81 3	280 5	10 35 5	04
	81	20 7	89 18	9	21 18	74 84	258 5	8 75 5	05
	82	18 7	75 18	9	19 18	66 62	230 5	7 98 5	04
	83	18 7	75 16	8	19 16	64 12	222	7 95 4	37
	84	16 6	62 16	8	17 16	56 46	196	7 08 4	49
	85	14 6	57 16	8	15 16	53 52	186	6 31 4	50
	86	16 6	62 16	8	17 16	52 46	182 5	6 95 4	48
	87	14 6	57 16	8	15 16	49 52	172 5	6 20 4	49
	88	14 6	46 16	8	15 16	47 06	164	6 45 4	51
	89	12 6	54 14	7	13 14	40 26	170	5 42 3	85
	90	12 6	54 14	7	13 14	45 76	158 5	5 32 4	83
	91	14 6	46 16	8	15 16	43 06	150 5	6 32 4	50
	92	12 6	44 14	7	13 14	43 38	150	5 53 3	86
	93	10 6	42 14	7	11 14	42 20	146	4 60 3	87
	94	12 6	44 14	7	13 14	39 88	138 5	5 42 3	84
	95	10 6	42 14	7	11 14	38 70	134 5	4 57 3	86
IS	96	24 7	100 18	9	26 18	103 8	357	10 96 5	07
	97	20 7	89 18	9	22 18	97 34	335	9 30 5	08
	98	18 7	75 18	9	20 18	89 12	307	8 52 5	08
	99	18 7	75 16	8	20 16	84 12	290	8 45 4	43
	100	16 6	62 16	8	18 16	76 46	264	7 61 4	52
	101	14 6	57 16	8	16 16	73 52	254	6 79 4	53
	102	16 6	62 16	8	18 16	68 46	237	7 41 4	51
	103	14 6	57 16	8	16 16	65 52	227	6 61 4	52
	104	12 6	54 14	7	14 14	65 76	223 5	5 86 3	90
	105	14 6	46 16	8	16 16	59 06	206	6 74 4	53
	106	12 6	44 14	7	14 14	59 76	206	5 69 3	88
	107	12 6	44 14	7	14 14	53 88	186	5 80 3	89
	108	10 6	42 14	7	12 14	52 70	182	4 91 3	91
IS	109	24 7	100 18	9	27 18	126 3	458 5	11 47 5	09
	110	20 7	89 18	9	23 18	119 84	438 5	9 76 5	10
	111	18 7	75 18	9	21 18	111 62	395 5	8 97 5	10
	112	16 7	75 16	8	21 16	104 12	360	8 66 4	46
	113	16 6	62 16	8	19 16	96 46	354	8 03 4	54
	114	14 6	57 16	8	17 16	93 52	324	7 21 4	55
	115	16 6	62 16	8	19 16	84 46	298 5	7 70 4	53
	116	14 6	57 16	8	17 16	81 52	293 5	6 96 4	54
	117	12 6	54 14	7	15 14	84 26	290 5	6 25 3	93
	118	12 6	54 14	7	15 14	73 76	265	6 02 3	91

COMPOUND STANCHIONS

SAFE LOAD IN TONS

SAFE LOAD

The above dimensions of stanchions are in feet

SAFE LOAD IN TONS

(SAFE LOAD IN TONS)

100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275	286	297	308	319	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528	539	550	561	572	583	594	605	616	627	638	649	660	672	684	696	708																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336	348	360	372	384	396	408	420	432	444	456	468	480	492	504	516	528	540	552	564	576	588	600	612	624	636	648	660	672	684	696	708	720	732	744	756	768	780																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351	364	377	390	403	416	429	442	455	468	481	494	507	520	533	546	559	572	585	598	611	624	637	650	663	676	689	702	715	728	741	754	767	780	793	806	819	832	845	858	871	884	897	910	923	936	949	962	975	988	1001	1014	1027	1040	1053	1066	1079	1092	1105	1118	1131	1144	1157	1170	1183	1196	1209	1222	1235	1248	1261	1274	1287	1300	1313	1326	1339	1352	1365	1378	1391	1404	1417	1430	1443	1456	1469	1482	1495	1508	1521	1534	1547	1560	1573	1586	1599	1612	1625	1638	1651	1664	1677	1690	1703	1716	1729	1742	1755	1768	1781	1794	1807	1820	1833	1846	1859	1872	1885	1898	1911	1924	1937	1950	1963	1976	1989	2002	2015	2028	2041	2054	2067	2080	2093	2106	2119	2132	2145	2158	2171	2184	2197	2210	2223	2236	2249	2262	2275	2288	2301	2314	2327	2340	2353	2366	2379	2392	2405	2418	2431	2444	2457	2470	2483	2496	2509	2522	2535	2548	2561	2574	2587	2600	2613	2626	2639	2652	2665	2678	2691	2704	2717	2730	2743	2756	2769	2782	2795	2808	2821	2834	2847	2860	2873	2886	2899	2912	2925	2938	2951	2964	2977	2990	3003	3016	3029	3042	3055	3068	3081	3094	3107	3120	3133	3146	3159	3172	3185	3198	3211	3224	3237	3250	3263	3276	3289	3302	3315	3328	3341	3354	3367	3380	3393	3406	3419	3432	3445	3458	3471	3484	3497	3510	3523	3536	3549	3562	3575	3588	3601	3614	3627	3640	3653	3666	3679	3692	3705	3718	3731	3744	3757	3770	3783	3796	3809	3822	3835	3848	3861	3874	3887	3900	3913	3926	3939	3952	3965	3978	3991	4004	4017	4030	4043	4056	4069	4082	4095	4108	4121	4134	4147	4160	4173	4186	4199	4212	4225	4238	4251	4264	4277	4290	4303	4316	4329	4342	4355	4368	4381	4394	4407	4420	4433	4446	4459	4472	4485	4498	4511	4524	4537	4550	4563	4576	4589	4602	4615	4628	4641	4654	4667	4680	4693	4706	4719	4732	4745	4758	4771	4784	4797	4810	4823	4836	4849	4862	4875	4888	4901	4914	4927	4940	4953	4966	4979	4992	5005	5018	5031	5044	5057	5070	5083	5096	5109	5122	5135	5148	5161	5174	5187	5200	5213	5226	5239	5252	5265	5278	5291	5304	5317	5330	5343	5356	5369	5382	5395	5408	5421	5434	5447	5460	5473	5486	5499	5512	5525	5538	5551	5564	5577	5590	5603	5616	5629	5642	5655	5668	5681	5694	5707	5720	5733	5746	5759	5772	5785	5798	5811	5824	5837	5850	5863	5876	5889	5902	5915	5928	5941	5954	5967	5980	5993	6006	6019	6032	6045	6058	6071	6084	6097	6110	6123	6136	6149	6162	6175	6188	6201	6214	6227	6240	6253	6266	6279	6292	6305	6318	6331	6344	6357	6370	6383	6396	6409	6422	6435	6448	6461	6474	6487	6500	6513	6526	6539	6552	6565	6578	6591	6604	6617	6630	6643	6656	6669	6682	6695	6708	6721	6734	6747	6760	6773	6786	6799	6812	6825	6838	6851	6864	6877	6890	6903	6916	6929	6942	6955	6968	6981	6994	7007	7020	7033	7046	7059	7072	7085	7098	7111	7124	7137	7150	7163	7176	7189	7202	7215	7228	7241	7254	7267	7280	7293	7306	7319	7332	7345	7358	7371	7384	7397	7410	7423	7436	7449	7462	7475	7488	7501	7514	7527	7540	7553	7566	7579	7592	7605	7618	7631	7644	7657	7670	7683	7696	7709	7722	7735	7748	7761	7774	7787	7800	7813	7826	7839	7852	7865	7878	7891	7904	7917	7930	7943	7956	7969	7982	7995	8008	8021	8034	8047	8060	8073	8086	8099	8112	8125	8138	8151	8164	8177	8190	8203	8216	8229	8242	8255	8268	8281	8294	8307	8320	8333	8346	8359	8372	8385	8398	8411	8424	8437	8450	8463	8476	8489	8502	8515	8528	8541	8554	8567	8580	8593	8606	8619	8632	8645	8658	8671	8684	8697	8710	8723	8736	8749	8762	8775	8788	8801	8814	8827	8840	8853	8866	8879	8892	8905	8918	8931	8944	8957	8970	8983	8996	9009	9022	9035	9048	9061	9074	9087	9100	9113	9126	9139	9152	9165	9178	9191	9204	9217	9230	9243	9256	9269	9282	9295	9308	9321	9334	9347	9360	9373	9386	9399	9412	9425	9438	9451	9464	9477	9490	9503	9516	9529	9542	9555	9568	9581	9594	9607	9620	9633	9646	9659	9672	9685	9698	9711	9724	9737	9750	9763	9776	9789	9802	9815	9828	9841	9854	9867	9880	9893	9906	9919	9932	9945	9958	9971	9984	9997	10010	10023	10036	10049	10062	10075	10088	10101	10114	10127	10140	10153	10166	10179	10192	10205	10218	10231	10244	10257	10270	10283	10296	10309	10322	10335	10348	10361	10374	10387	10400	10413	10426	10439	10452	10465	10478	10491	10504	10517	10530	10543	10556	10569	10582	10595	10608	10621	10634	10647	10660	10673	10686	10699	10712	10725	10738	10751	10764	10777	10790	10803	10816	10829	10842	10855	10868	10881	10894	10907	10920	10933	10946	10959	10972	10985	10998	11011	11024	11037	11050	11063	11076	11089	11102	11115	11128	11141	11154	11167	11180	11193	11206	11219	11232	11245	11258	11271	11284	11297	11310	11323	11336	11349	11362	11375	11388	11401	11414	11427	11440	11453	11466	11479	11492	11505	11518	11531	11544	11557	11570	11583	11596	11609	11622	11635	11648	11661	11674	11687	11700	11713	11726	11739	11752	11765	11778	11791	11804	11817	11830	11843	11856	11869	11882	11895	11908	11921	11934	11947	11960	11973	11986	11999	12012	12025	12038	12051	12064	12077	12090	12103	12116	12129	12142	12155	12168	12181	12194	12207	12220	12233	12246	12259	12272	12285	12298	12311	12324	12337	12350	12363	12376	12389	12402	12415	12428	12441	12454	12467	12480	12493	12506	12519	12532	12545	12558	12571	12584	12597	12610	12623	12636	12649	12662	12675	12688	12701	12714	12727	12740	12753	12766	12779	12792	12805	12818	12831	12844	12857	12870	12883	12896	12909	12922	12935	12948	12961	12974	12987	13000	13013	13026	13039	13052	13065	13078	13091	13104	13117	13130	13143	13156	13169	13182	13195	13208	13221	13234	13247	13260	13273	13286	13299	13312	13325	13338	13351	13364	13377	13390	13403	13416	13429	13442	13455	13468	13481	13494	13507	13520	13533	13546	13559	13572	13585	13598	13611	13624	13637	13650	13663	13676	13689	13702	13715	13728	13741	13754	13767	13780	13793	13806	13819	13832	13845	13858	13871	13884	13897	13910	13923	13936	13949	13962	13975	13988	14001	14014	14027	14040	14053	14066	14079	14092	14105	14118	14131	14144	14157	14170	14183	14196	14209	14222	14235	14248	14261	14274	14287	14300	14313	14326	14339	14352	14365	14378	14391	14404	14417	14430	14443	14456	14469	14482	14495	14508	14521	14534	14547	14560	14573	14586	14599	14612	14625	14638	14651	14664	14677	14690	14703	1

COMPOUND STANCHIONS.

DIMENSIONS AND PROPERTIES.






Reference Mark	COMPOSED OF		Curves of Beams	Dimensions in inches		Area square inches	Weight per foot - lbs.	Radii of Gyration in inches	
	Beams	Flats		Depth	Width			About xx	About yy
	IS 119	24 7	100 24	7	25	24	118 20	410	10 286 68
	120	20 7	89 24	7	21	24	108 51	377	8 696 70
	121	18 7	75 24	7	19	24	96 18	335	7 936 69
	122	16 6	62 20	6	17	20	79 69	279	7 005 55
	IS 123	24 7	100 24	7	26	24	128 2	512	10 886 73
	124	20 7	89 24	7	22	24	138 51	479	9 226 75
	125	18 7	75 24	7	20	24	126 18	437	8 456 75
	126	16 6	62 20	6	18	20	104 69	383	7 515 60
	IS 127	24 7	100 24	7	27	24	178 2	618 5	11 376 77
	128	20 7	89 24	7	23	24	168 51	585 5	9 686 78
	129	18 7	75 24	7	21	24	156 18	543 5	8 896 78
	130	16 6	62 20	6	19	20	129 69	453 5	7 945 63
Reference Mark	COMPOSED OF			Dimensions in inches		Area square inches	Weight per foot - lbs.	Radii of Gyration in inches	
	Beams	Beams		Depth	Width			About xx	About yy
	IS 131	20 7	89 10 8 70	20	20	67 37	331	6 185 32	
	132	18 7	75 10 7 58	18	18	56 18	198	4 704 78	
	133	16 6	62 10 6 35	16	16	48 31	134	4 424 00	
	134	14 6	57 10 5 35	14	14	37 84	121	3 904 07	
Reference Mark	COMPOSED OF			Dimensions in inches		Area square inches	Weight per foot - lbs.	Radii of Gyration in inches	
	Zeds	Flats		Depth	Width			About xx	About yy
	ZS 1	8 3	22 68 10 18	10	10	31 68	110	4 82 4 70	
	2	7 3	20 22 10 18	14	14	28 29	98	4 26 4 27	
	3	6 3	17 88 10 18	12	14	25 03	87	3 69 3 85	
	4	5 3	14 17 10 18	10	12	20 18	70 5	3 07 3 34	

TABLE 1. LISTING OF THE STATIONS

COMPOUND STATIONS

SEE LIST OF THE

SEE LIST

The following table shows the stations

SEE LIST OF THE

LISTING OF THE

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54

55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

70 71 72 73 74 75 76 77 78 79 80 81 82 83 84

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114

115 116 117 118 119 120 121 122 123 124 125 126 127 128 129

130 131 132 133 134 135 136 137 138 139 140 141 142 143 144

145 146 147 148 149 150 151 152 153 154 155 156 157 158 159

160 161 162 163 164 165 166 167 168 169 170 171 172 173 174

175 176 177 178 179 180 181 182 183 184 185 186 187 188 189

190 191 192 193 194 195 196 197 198 199 200 201 202 203 204

205 206 207 208 209 210 211 212 213 214 215 216 217 218 219

SEE LIST OF THE

LISTING OF THE

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54

55 56 57 58 59 60 61 62 63 64 65 66 67 68 69

70 71 72 73 74 75 76 77 78 79 80 81 82 83 84

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114

115 116 117 118 119 120 121 122 123 124 125 126 127 128 129

130 131 132 133 134 135 136 137 138 139 140 141 142 143 144

145 146 147 148 149 150 151 152 153 154 155 156 157 158 159

160 161 162 163 164 165 166 167 168 169 170 171 172 173 174

175 176 177 178 179 180 181 182 183 184 185 186 187 188 189

190 191 192 193 194 195 196 197 198 199 200 201 202 203 204

205 206 207 208 209 210 211 212 213 214 215 216 217 218 219

220 221 222 223 224 225 226 227 228 229 230 231 232 233 234

235 236 237 238 239 240 241 242 243 244 245 246 247 248 249

250 251 252 253 254 255 256 257 258 259 260 261 262 263 264


265 266 267 268 269 270 271 272 273 274 275 276 277 278 279

280 281 282 283 284 285 286 287 288 289 290 291 292 293 294

DORMAN, LONG & CO. LIMITED.

CHANNEL STANCHIONS.

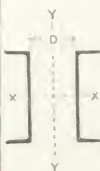
DIMENSIONS AND PROPERTIES.



Reference Mark	Size Inches	Area square inches	Weight per foot lbs.	Radii of Gyration in inches	
				About xx	About yy
OS 1	15 x 4	12.334	41.94	5.53	1.09
2	12 x 4	10.727	36.47	4.51	1.13
3	10 x 4	8.871	30.16	3.84	1.16
4	12 x 3 1/2	9.671	32.88	4.44	.96
5	11 x 3 1/2	8.771	29.82	4.12	.98
6	10 x 3 1/2	8.296	28.21	3.77	.99
7	12 x 3	7.675	26.10	4.55	.99
8	9 x 3 1/2	7.469	25.39	3.43	1.01
9	10 x 3 1/2	6.925	23.55	3.85	1.02
10	8 x 3 1/2	6.682	22.72	3.09	1.03
11	9 x 3 1/2	6.55	22.27	3.49	1.03
12	7 x 3 1/2	5.95	20.23	2.74	1.04
13	6 x 3 1/2	5.266	17.90	2.37	1.06
14*	8 x 3	5.675	19.30	3.07	.87
15	9 x 3	5.696	19.37	3.38	.84
16	7 x 3	5.166	17.56	2.70	.88
17	5 1/2 x 2 1/2	4.728	16.08	1.96	.85
18	6 x 3	4.261	14.49	2.37	.91
19	4 x 3	4.175	14.20	1.56	.91

LATTICED CHANNEL STANCHIONS.

DIMENSIONS AND PROPERTIES.



Reference Mark	COMPOSED OF Channels		Distance inches o	Dimensions in inches		Area square inches	Radii of Gyration in inches	
				Depth	Width		About xx	About yy
OS 20	15	4	41.94	9	15	17	5.52	5.78
21	12	3	32.88	6	12	13	4.44	4.22
22	11	3	29.82	6	11	13	4.11	4.26
23	12	3	26.1	6	12	13	4.54	4.23
24	10	3	28.21	4	10	11	3.77	3.33
25	9	3	25.39	4	9	11	3.43	3.37
26	10	3	23.55	4	10	11	3.85	3.34
27	9	3	22.27	4	9	11	3.49	3.39
28	9	3	19.37	5	9	11	3.38	3.6
29	7	3	17.56	3 1/2	7	9	2.7	2.76

2006年12月15日 星期三

地址: 上海南京路 100 号 邮编: 200003




Received 12 May 2004; accepted 18 May 2004

上海大学 (2015 级) 中国现当代文学专业 硕士研究生学位论文

DORMAN, LONG & CO. LIMITED.

CHANNEL COMPOUND STANCHIONS.

DIMENSIONS AND PROPERTIES.

Reference Mark	COMPOSED OF		Distance in inches o	Dimen- sions in inches		Area square inches	Weight per foot-lb.	Radii of Gyration in inches	
	Channels	Flats		Depth	Width			About x x	About y y
	CS 30	15 4	41 94 18	9	16	18 47 17	163	6 7 15	5 1
	31	15 4	41 94 18	9	16	18 42 67	147 5	6 5 55	5 4
	32	12 3	32 88 14	6	13	14 36 84	128	5 4 14	1 4
	33	11 3	29 82 14	6	12	14 35 04	122	5 0 34	1 5
	34	12 3	32 88 14	6	13	14 33 34	116	5 2 74	1 5
	35	12 3	26 1 14	6	13	14 32 85	114 5	5 5 54	1 3
	36	11 3	29 82 14	6	12	14 31 54	110	4 9 14	1 6
	37	10 3	28 21 12	4	11	12 31 59	110	4 5 73	4 0
	38	12 3	26 1 14	6	13	14 29 35	102 5	5 4 24	1 4
	39	9 3	25 39 12	4	10	12 29 94	104 5	4 1 83	4 2
	40	10 3	28 21 12	4	11	12 28 59	100	4 4 53	3 9
	41	9 3	25 39 12	4	10	12 26 94	94	4 0 73	4 1
	42	10 3	23 55 12	4	11	12 25 85	90 5	4 5 53	4 0
	43	9 3	22 27 12	4	10	12 25 10	88	4 1 43	4 2
	44	9 3	19 37 12	5	10	12 23 39	82	4 1 43	5 3
	45	7 3	17 56 10	3	8	10 20 33	72	3 2 62	2 2
	46	7 3	17 56 10	3	7	10 17 83	63 5	3 1 52	2 2
	CS 47	15 4	41 94 18	9	17	18 69 67	239 5	7 3 15	5 4 1
	48	15 4	41 94 18	9	17	18 60 67	209	7 1 5	4 4
	49	12 3	32 88 14	6	14	14 54 34	187 5	5 9 54	4 10
	50	11 3	29 82 14	6	13	14 52 54	181 5	5 5 44	1 1
	51	12 3	32 88 14	6	14	14 47 34	163 5	5 7 54	1 2
	52	11 3	29 82 14	6	13	14 45 54	157 5	5 3 64	1 2
	53	12 3	26 1 14	6	14	14 43 35	150	5 8 84	1 1
	54	10 3	28 21 12	4	12	12 46 59	161	5 0 53	4 2
	55	9 3	25 39 12	4	11	12 44 94	155 5	4 6 43	4 3
	56	10 3	28 21 12	4	12	12 40 59	141	4 8 73	4 1
	57	9 3	25 39 12	4	11	12 38 94	135	4 4 73	4 3
	58	10 3	23 55 12	4	12	12 37 85	131 5	4 9 63	4 2
	59	9 3	22 27 12	4	11	12 37 10	129	4 5 33	4 4
	60	9 3	19 37 12	5	11	12 35 39	123	4 5 53	5 0
	61	7 3	17 56 10	3	9	10 30 35	106	3 6 12	8 4
	62	7 3	17 56 10	3	8	10 25 33	89	3 4 52	8 4
	CS 63	15 4	41 94 18	9	18	18 92 17	317 5	7 7 8	5 3 6
	64	15 4	41 94 18	9	18	18 78 67	271 5	7 5 1	5 3 9
	65	12 3	32 88 14	6	15	14 61 34	212 5	6 1 24	1 0

DERMAN, LONG & CO. LIMITED.

CHANNEL COMPOUND STANCHIONS.

SAFE LOADS IN TONS

ENDS FIXED

For other conditions of ends see page 82.

SAFE LOADS IN TONS FOR														Reference Mark
LENGTHS IN FEET														
10	12	14	16	18	20	22	24	26	28	30	32	36	40	
278	276	274	272	269	266	263	259	255	251	246	241	234	229	68 30
252	250	248	246	244	241	238	235	231	227	223	219	210	200	51
216	212	209	206	202	198	193	188	183	178	172	166	153	140	52
204	202	199	196	193	189	184	179	174	169	164	159	146	133	53
194	192	189	186	183	179	175	171	166	161	156	151	139	126	54
191	189	186	183	180	177	172	168	163	158	153	148	136	124	55
184	182	179	176	173	170	166	162	158	153	148	143	132	120	56
182	179	175	171	166	161	156	150	144	137	130	123	109		57
171	169	167	164	161	158	154	150	146	142	137	132	122	111	58
172	169	166	162	158	154	149	144	138	133	127	121	111		59
165	162	159	154	150	145	140	135	129	124	117	110			60
164	162	149	146	142	138	133	128	123	117	111	105			61
149	146	143	140	136	132	127	123	117	112	106	100			62
145	142	139	136	132	128	124	119	114	109	104				63
135	133	130	127	124	121	117	113	108	104	99				64
115	112	109	106	103	99	95	91	86	80					65
101	98	95	92	88	84	80	76	70						66
111	108	105	101	98	94	90	86	81	77	72	67	62	57	64 17
957	955	953	949	945	941	937	932	927	921	915	909	898	889	48
817	813	808	803	798	792	785	777	769	761	753	744	734	723	49
806	802	798	794	789	783	775	768	761	753	744	734	723	712	50
570	573	569	565	560	554	548	542	536	529	523	516	509	501	51
595	592	589	585	580	574	568	562	556	549	543	536	529	521	52
558	550	546	542	538	533	527	521	515	509	502	495	488	480	53
596	594	590	585	580	574	568	562	556	549	543	536	529	521	54
559	554	549	544	537	530	523	516	509	502	495	488	480	471	55
594	590	585	580	574	567	560	553	546	539	532	525	518	510	56
524	520	516	511	505	499	492	485	478	470	463	456	449	441	57
516	514	510	505	499	492	485	478	470	463	456	449	441	433	58
514	510	506	501	495	488	481	474	467	460	453	446	439	431	59
505	500	497	493	488	482	475	468	461	453	446	439	431	423	60
172	167	162	157	151	144	137	130	123	116	110				61
145	140	136	131	125	120	114	108	101						62
542	539	535	530	524	518	511	504	497	490	483	476	469	462	68 43
464	461	457	452	447	442	436	430	423	416	409	402	395	388	69
557	555	551	547	542	536	530	523	516	509	502	495	488	480	70

DORMAN, LONG & CO. LIMITED.

TEES AS STRUTS.
SAFE LOADS IN TONS FOR TEES.
ENDS FIXED.

For other conditions of ends see page 65.

Size and Thickness	LENGTH IN FEET										
	2	3	4	5	6	7	8	9	10	12	
6 1/2 x 3 1/2	23.5	21.1	20.5	19.9	19.1	18.2	17.2	16.2	15.0	12.5	
6 1/2 x 3 1/4	22.2	20.7	20.0	20.1	25.1	23.8	22.6	21.1	19.5	16.3	
6 1/2 x 3 1/8	21.7	20.0	23.2	22.1	30.8	29.3	27.7	25.9	23.0	19.9	
6 1/2 x 3 1/16	19.0	18.3	17.4	16.2	14.9	13.4	11.8	10.4	9.1	..	
6 1/2 x 3 1/32	24.2	23.9	22.7	21.1	19.4	17.4	15.3	13.4	11.6	..	
6 1/2 x 3 1/64	20.1	20.4	27.8	25.9	23.7	21.1	18.5	16.2	14.2	..	
5 1/2 x 4 1/2	19.2	18.8	18.3	17.6	16.8	15.9	14.9	13.8	12.6	10.4	
5 1/2 x 4 1/4	25.2	24.7	24.0	23.2	22.2	21.0	19.8	18.4	16.8	14.0	
5 1/2 x 4 1/8	16.6	16.2	15.5	14.5	13.4	12.2	10.9	9.6	8.5	..	
5 1/2 x 4 1/16	21.9	21.2	20.2	18.3	17.6	15.8	14.0	12.4	10.9	..	
4 1/2 x 4 1/2	16.7	16.2	15.4	14.4	13.3	12.0	10.7	9.4	8.3	..	
4 1/2 x 4 1/4	21.9	21.2	20.2	19.0	17.6	16.0	14.2	12.6	11.1	..	
4 1/2 x 4 1/8	14.6	14.1	13.6	12.8	11.8	10.8	9.8	8.7	7.8	..	
4 1/2 x 4 1/16	19.0	18.4	17.6	16.6	15.5	14.2	12.7	11.2	9.9	..	
3 1/2 x 5 1/2	14.4	13.8	12.9	11.8	10.7	9.3	8.1	7.0	..	..
3 1/2 x 5 1/4	18.9	18.2	17.0	15.7	14.2	12.5	10.6	9.4	..	..
3 1/2 x 5 1/8	12.3	11.4	10.4	9.3	8.0	6.5	5.7	..	..	..
3 1/2 x 5 1/16	15.0	14.5	13.7	12.3	10.7	9.1	7.7	..	..	..
3 1/2 x 5 1/32	11.0	10.5	9.8	8.7	7.6	6.5	5.6	..	..	..
3 1/2 x 5 1/64	14.4	13.7	12.7	11.5	10.1	8.7	7.4	..	..	..
2 1/2 x 6 1/2	6.7	6.1	5.5	4.4	3.6	..	..	..	..	..
2 1/2 x 6 1/4	8.2	7.5	6.6	5.5	4.3	..	..	..	..	..
2 1/2 x 6 1/8	9.7	8.9	7.9	6.6	5.4	..	..	..	..	..
2 1/2 x 6 1/16	5.0	4.2	4.4	3.6	2.8	..	..	..	..	..
2 1/2 x 6 1/32	8.6	7.7	6.8	5.4	4.1	..	..	..	..	..
2 1/2 x 6 1/64	5.1	4.4	3.5	2.7	..	..	..	..	..	..
2 1/2 x 6 1/128	7.4	6.5	5.3	4.1	..	..	..	..	..	..
2 1/2 x 1 1/2 x 1/4	4.4	3.9	3.2	2.6	..	..	..	..	..	..
2 1/2 x 1 1/2 x 1/8	6.7	5.5	4.8	3.6	..	..	..	..	..	..
1 1/2 x 2 1/2 x 1/4	3.8	2.9	..	..	..	..	..	..	..	..
1 1/2 x 2 1/2 x 1/8	4.0	3.6	..	..	..	..	..	..	..	..
1 1/2 x 1 1/2 x 1/4	4.1	3.6	2.7	..	..	..	..	..	..	..
1 1/2 x 1 1/2 x 1/8	5.2	4.4	3.4	..	..	..	..	..	..	..
1 1/2 x 1 1/2 x 1/16	3.4	2.6	1.9	..	..	..	..	..	..	..

DORMAN, LONG & CO. LIMITED.

ANGLES AS STRUTS.

SAFE LOADS IN TONS FOR SINGLE UNEQUAL ANGLES.
ENDS FIXED.

For other conditions of ends see page 65.

Size and Thickness	LENGTH IN FEET									
	2	3	4	5	6	7	8	9	10	12
7 x 3 1/2	58.7	44.5	32.4	24.1	18.0	13.4	10.7	8.1	6.1	4.1
" " 1/2	42.3	31.5	22.1	16.1	11.7	8.8	6.2	4.7	3.6	2.4
6 x 4 1/2	38.0	27.1	19.8	14.2	10.3	7.6	5.7	4.3	3.2	2.1
" " 1/2	27.7	20.5	14.8	10.3	7.6	5.7	4.3	3.2	2.1	1.4
6 x 4	34.2	23.3	16.8	12.3	8.9	6.6	4.9	3.7	2.8	1.8
" " 1/2	24.1	17.9	12.6	9.1	6.6	4.9	3.7	2.8	1.8	1.2
6 x 3 1/2	32.4	21.5	15.6	11.1	8.1	6.1	4.6	3.5	2.6	1.7
" " 1/2	24.1	17.9	12.6	9.1	6.6	4.9	3.7	2.8	1.8	1.2
5 1/2 x 3 1/2	24.1	17.9	12.6	9.1	6.6	4.9	3.7	2.8	1.8	1.2
" " 1/2	18.0	13.4	9.8	7.2	5.4	4.1	3.1	2.3	1.7	1.1
5 1/2 x 3	22.1	16.1	11.7	8.8	6.6	5.0	3.8	2.9	2.1	1.4
" " 1/2	16.1	11.7	8.8	6.6	5.0	3.8	2.9	2.1	1.4	0.9
5 x 4	20.5	14.8	10.3	7.6	5.7	4.3	3.2	2.4	1.8	1.2
" " 1/2	14.8	10.3	7.6	5.7	4.3	3.2	2.4	1.8	1.2	0.8
5 x 3 1/2	18.0	13.4	9.8	7.2	5.4	4.1	3.1	2.3	1.7	1.1
" " 1/2	13.4	9.8	7.2	5.4	4.1	3.1	2.3	1.7	1.1	0.7
5 x 3	16.1	11.7	8.8	6.6	5.0	3.8	2.9	2.1	1.4	0.9
" " 1/2	11.7	8.8	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6
4 1/2 x 3 1/2	12.6	9.1	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6
" " 1/2	9.1	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6	0.4
4 1/2 x 3	10.3	7.6	5.7	4.3	3.2	2.4	1.8	1.2	0.8	0.5
" " 1/2	7.6	5.7	4.3	3.2	2.4	1.8	1.2	0.8	0.5	0.3
4 x 3 1/2	9.8	7.2	5.4	4.1	3.1	2.3	1.7	1.1	0.7	0.4
" " 1/2	7.2	5.4	4.1	3.1	2.3	1.7	1.1	0.7	0.4	0.3
4 x 3	8.8	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6	0.4
" " 1/2	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6	0.4	0.2
3 1/2 x 3 1/2	8.1	6.1	4.6	3.5	2.6	1.9	1.4	1.0	0.7	0.4
" " 1/2	6.1	4.6	3.5	2.6	1.9	1.4	1.0	0.7	0.4	0.3
3 1/2 x 3	7.2	5.4	4.1	3.1	2.3	1.7	1.1	0.7	0.4	0.3
" " 1/2	5.4	4.1	3.1	2.3	1.7	1.1	0.7	0.4	0.3	0.2
3 1/2 x 2 1/2	6.6	5.0	3.8	2.9	2.1	1.4	0.9	0.6	0.4	0.3
" " 1/2	5.0	3.8	2.9	2.1	1.4	0.9	0.6	0.4	0.3	0.2
3 x 3 1/2	5.7	4.3	3.2	2.4	1.8	1.2	0.8	0.5	0.3	0.2
" " 1/2	4.3	3.2	2.4	1.8	1.2	0.8	0.5	0.3	0.2	0.1
3 x 3	4.9	3.7	2.8	2.1	1.6	1.1	0.8	0.5	0.3	0.2
" " 1/2	3.7	2.8	2.1	1.6	1.1	0.8	0.5	0.3	0.2	0.1
3 x 2 1/2	4.1	3.1	2.3	1.7	1.1	0.7	0.4	0.3	0.2	0.1
" " 1/2	3.1	2.3	1.7	1.1	0.7	0.4	0.3	0.2	0.1	0.0
3 x 2	3.8	2.9	2.1	1.4	0.9	0.6	0.4	0.3	0.2	0.1
" " 1/2	2.9	2.1	1.4	0.9	0.6	0.4	0.3	0.2	0.1	0.0
2 1/2 x 2 1/2	3.2	2.4	1.8	1.2	0.8	0.5	0.3	0.2	0.1	0.0
" " 1/2	2.4	1.8	1.2	0.8	0.5	0.3	0.2	0.1	0.0	0.0
2 1/2 x 2	2.8	2.1	1.6	1.1	0.7	0.4	0.3	0.2	0.1	0.0
" " 1/2	2.1	1.6	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0
2 x 1 1/2	2.4	1.8	1.2	0.8	0.5	0.3	0.2	0.1	0.0	0.0
" " 1/2	1.8	1.2	0.8	0.5	0.3	0.2	0.1	0.0	0.0	0.0
2 x 1 1/2	2.1	1.6	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0
" " 1/2	1.6	1.1	0.7	0.4	0.3	0.2	0.1	0.0	0.0	0.0

DORMAN LONG & CO. LIMITED

ANGLES AS STRUTS

SAFE LOADS IN TONS FOR TWO EQUAL ANGLES
ENDS FIXED

For other conditions of ends see page 88



Size and Thickness	L	Safe Load in Tons	LENGTHS IN FEET										
			12	14	16	18	20	22	24	26	28	30	32
2 x 2	1/4	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0
2 x 2	3/8	15.0	18.0	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0
2 x 2	1/2	20.0	24.0	28.0	32.0	36.0	40.0	44.0	48.0	52.0	56.0	60.0	64.0
2 x 2	5/8	25.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0	90.0
2 x 2	3/4	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0
2 x 2	7/8	35.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0
2 x 2	1	40.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0
2 x 2	1 1/4	45.0	54.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0
2 x 2	1 1/2	50.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0
2 x 2	1 3/4	55.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0
2 x 2	2	60.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0
2 x 2	2 1/4	65.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0
2 x 2	2 1/2	70.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0
2 x 2	2 3/4	75.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0
2 x 2	3	80.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0
2 x 2	3 1/4	85.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0	162.0
2 x 2	3 1/2	90.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0	162.0	168.0
2 x 2	3 3/4	95.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0	162.0	168.0	174.0
2 x 2	4	100.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0	162.0	168.0	174.0	180.0
2 x 2	4 1/4	105.0	126.0	132.0	138.0	144.0	150.0	156.0	162.0	168.0	174.0	180.0	186.0
2 x 2	4 1/2	110.0	132.0	138.0	144.0	150.0	156.0	162.0	168.0	174.0	180.0	186.0	192.0
2 x 2	4 3/4	115.0	138.0	144.0	150.0	156.0	162.0	168.0	174.0	180.0	186.0	192.0	198.0
2 x 2	5	120.0	144.0	150.0	156.0	162.0	168.0	174.0	180.0	186.0	192.0	198.0	204.0
2 x 2	5 1/4	125.0	150.0	156.0	162.0	168.0	174.0	180.0	186.0	192.0	198.0	204.0	210.0
2 x 2	5 1/2	130.0	156.0	162.0	168.0	174.0	180.0	186.0	192.0	198.0	204.0	210.0	216.0
2 x 2	5 3/4	135.0	162.0	168.0	174.0	180.0	186.0	192.0	198.0	204.0	210.0	216.0	222.0
2 x 2	6	140.0	168.0	174.0	180.0	186.0	192.0	198.0	204.0	210.0	216.0	222.0	228.0
2 x 2	6 1/4	145.0	174.0	180.0	186.0	192.0	198.0	204.0	210.0	216.0	222.0	228.0	234.0
2 x 2	6 1/2	150.0	180.0	186.0	192.0	198.0	204.0	210.0	216.0	222.0	228.0	234.0	240.0
2 x 2	6 3/4	155.0	186.0	192.0	198.0	204.0	210.0	216.0	222.0	228.0	234.0	240.0	246.0
2 x 2	7	160.0	192.0	198.0	204.0	210.0	216.0	222.0	228.0	234.0	240.0	246.0	252.0
2 x 2	7 1/4	165.0	198.0	204.0	210.0	216.0	222.0	228.0	234.0	240.0	246.0	252.0	258.0
2 x 2	7 1/2	170.0	204.0	210.0	216.0	222.0	228.0	234.0	240.0	246.0	252.0	258.0	264.0
2 x 2	7 3/4	175.0	210.0	216.0	222.0	228.0	234.0	240.0	246.0	252.0	258.0	264.0	270.0
2 x 2	8	180.0	216.0	222.0	228.0	234.0	240.0	246.0	252.0	258.0	264.0	270.0	276.0
2 x 2	8 1/4	185.0	222.0	228.0	234.0	240.0	246.0	252.0	258.0	264.0	270.0	276.0	282.0
2 x 2	8 1/2	190.0	228.0	234.0	240.0	246.0	252.0	258.0	264.0	270.0	276.0	282.0	288.0
2 x 2	8 3/4	195.0	234.0	240.0	246.0	252.0	258.0	264.0	270.0	276.0	282.0	288.0	294.0
2 x 2	9	200.0	240.0	246.0	252.0	258.0	264.0	270.0	276.0	282.0	288.0	294.0	300.0
2 x 2	9 1/4	205.0	246.0	252.0	258.0	264.0	270.0	276.0	282.0	288.0	294.0	300.0	306.0
2 x 2	9 1/2	210.0	252.0	258.0	264.0	270.0	276.0	282.0	288.0	294.0	300.0	306.0	312.0
2 x 2	9 3/4	215.0	258.0	264.0	270.0	276.0	282.0	288.0	294.0	300.0	306.0	312.0	318.0
2 x 2	10	220.0	264.0	270.0	276.0	282.0	288.0	294.0	300.0	306.0	312.0	318.0	324.0
2 x 2	10 1/4	225.0	270.0	276.0	282.0	288.0	294.0	300.0	306.0	312.0	318.0	324.0	330.0
2 x 2	10 1/2	230.0	276.0	282.0	288.0	294.0	300.0	306.0	312.0	318.0	324.0	330.0	336.0
2 x 2	10 3/4	235.0	282.0	288.0	294.0	300.0	306.0	312.0	318.0	324.0	330.0	336.0	342.0
2 x 2	11	240.0	288.0	294.0	300.0	306.0	312.0	318.0	324.0	330.0	336.0	342.0	348.0
2 x 2	11 1/4	245.0	294.0	300.0	306.0	312.0	318.0	324.0	330.0	336.0	342.0	348.0	354.0
2 x 2	11 1/2	250.0	300.0	306.0	312.0	318.0	324.0	330.0	336.0	342.0	348.0	354.0	360.0
2 x 2	11 3/4	255.0	306.0	312.0	318.0	324.0	330.0	336.0	342.0	348.0	354.0	360.0	366.0
2 x 2	12	260.0	312.0	318.0	324.0	330.0	336.0	342.0	348.0	354.0	360.0	366.0	372.0
2 x 2	12 1/4	265.0	318.0	324.0	330.0	336.0	342.0	348.0	354.0	360.0	366.0	372.0	378.0
2 x 2	12 1/2	270.0	324.0	330.0	336.0	342.0	348.0	354.0	360.0	366.0	372.0	378.0	384.0
2 x 2	12 3/4	275.0	330.0	336.0	342.0	348.0	354.0	360.0	366.0	372.0	378.0	384.0	390.0
2 x 2	13	280.0	336.0	342.0	348.0	354.0	360.0	366.0	372.0	378.0	384.0	390.0	396.0
2 x 2	13 1/4	285.0	342.0	348.0	354.0	360.0	366.0	372.0	378.0	384.0	390.0	396.0	402.0
2 x 2	13 1/2	290.0	348.0	354.0	360.0	366.0	372.0	378.0	384.0	390.0	396.0	402.0	408.0
2 x 2	13 3/4	295.0	354.0	360.0	366.0	372.0	378.0	384.0	390.0	396.0	402.0	408.0	414.0
2 x 2	14	300.0	360.0	366.0	372.0	378.0	384.0	390.0	396.0	402.0	408.0	414.0	420.0
2 x 2	14 1/4	305.0	366.0	372.0	378.0	384.0	390.0	396.0	402.0	408.0	414.0	420.0	426.0
2 x 2	14 1/2	310.0	372.0	378.0	384.0	390.0	396.0	402.0	408.0	414.0	420.0	426.0	432.0
2 x 2	14 3/4	315.0	378.0	384.0	390.0	396.0	402.0	408.0	414.0	420.0	426.0	432.0	438.0
2 x 2	15	320.0	384.0	390.0	396.0	402.0	408.0	414.0	420.0	426.0	432.0	438.0	444.0
2 x 2	15 1/4	325.0	390.0	396.0	402.0	408.0	414.0	420.0	426.0	432.0	438.0	444.0	450.0
2 x 2	15 1/2	330.0	396.0	402.0	408.0	414.0	420.0	426.0	432.0	438.0	444.0	450.0	456.0
2 x 2	15 3/4	335.0	402.0	408.0	414.0	420.0	426.0	432.0	438.0	444.0	450.0	456.0	462.0
2 x 2	16	340.0	408.0	414.0	420.0	426.0	432.0	438.0	444.0	450.0	456.0	462.0	468.0
2 x 2	16 1/4	345.0	414.0	420.0	426.0	432.0	438.0	444.0	450.0	456.0	462.0	468.0	474.0
2 x 2	16 1/2	350.0	420.0	426.0	432.0	438.0	444.0	450.0	456.0	462.0	468.0	474.0	480.0
2 x 2	16 3/4	355.0	426.0	432.0	438.0	444.0	450.0	456.0	462.0	468.0	474.0	480.0	486.0
2 x 2	17	360.0	432.0	438.0	444.0	450.0	456.0	462.0	468.0	474.0	480.0	486.0	492.0
2 x 2	17 1/4	365.0	438.0	444.0	450.0	456.0	462.0	468.0	474.0	480.0	486.0	492.0	498.0
2 x 2	17 1/2	370.0	444.0	450.0	456.0	462.0	468.0	474.0	480.0	486.0	492.0	498.0	504.0
2 x 2	17 3/4	375.0	450.0	456.0	462.0	468.0	474.0	480.0	486.0	492.0	498.0	504.0	510.0
2 x 2	18	380.0	456.0	462.0	468.0	474.0	480.0	486.0	492.0	498.0	504.0	510.0	516.0
2 x 2	18 1/4	385.0	462.0	468.0	474.0	480.0	486.0	492.0	498.0	504.0	510.0	516.0	522.0
2 x 2	18 1/2	390.0	468.0	474.0	480.0	486.0	492.0	498.0	504.0	510.0	516.0	522.0	528.0
2 x 2	18 3/4	395.0	474.0	480.0	486.0	492.0	498.0	504.0	510.0	516.0	522.0	528.0	534.0
2 x 2	19	400.0	480.0	486.0	492.0	498.0	504.0	510.0	516.0	522.0	528.0	534.0	540.0
2 x 2	19 1/4	405.0	486.0	492.0	498.0	504.0	510.0	516.0	522.0	528.0	534.0	540.0	546.0
2 x 2	19 1/2	410.0	492.0	498.0	504.0	510.0	516.0	522.0	528.0	534.0	540.0	546.0	552.0
2 x 2	19 3/4	415.0	498.0	504.0	510.0	516.0	522.0	528.0	534.0	540.0	546.0	552.0	558.0
2 x 2	20	420.0	504.0	510.0									

DORMAN, LONG & CO. LIMITED.

ANGLES AS STRUTS.

SAFE LOADS IN TONS FOR TWO UNEQUAL ANGLES.
ENDS FIXED.

For other conditions see end of page 65.



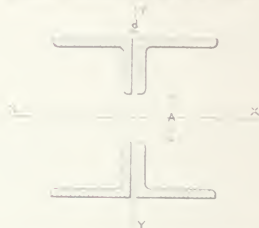
Size and Thickness	d	Radial Gyration		LENGTH IN FEET																		
		xx	yy	2	3	4	5	6	8	10	12	14	16	18	20							
1 1/2" 1/2"	1 1/2"	2 3/4	1 4/7	53 3 58	7 57 1 56	5 55	3 51	7 47	4 42	5 37	0 32	1 27 7										
2 1/2" 1/2"	2 1/2"	3 3/4	1 4/7	75 3 78	5 71 4 69	3 68	3 64	2 50	1 53	3 45	6 40	5 35 1										
3 1/2" 1/2"	3 1/2"	4 3/4	1 4/7	95 3 85	5 84 7 83	1 91	2 76	4 67	7 54	0 56	4 49	1 42 1										
4 1/2" 1/2"	4 1/2"	5 3/4	1 1/2	115 3 62	3 61 6 50	5 66	1 52	0 56	4 52	2 48	2 44	3 40	6 36 5									
5 1/2" 1/2"	5 1/2"	6 3/4	1 1/2	135 3 76	3 76 1 75	3 74	3 71	8 66	7 64	9 60	7 56	1 50	9 45 8									
6 1/2" 1/2"	6 1/2"	7 3/4	1 1/2	155 3 136	3 1 7 90	1 50	3 89	3 88	2 85	3 81	6 77	2 72	4 67	0 00	5 55 0							
7 1/2" 1/2"	7 1/2"	8 3/4	1 1/2	175 3 107	4 18 48 3	41 6 47	7 39	6 36	9 33	6 29	8 25	8 22	2 19 1									
8 1/2" 1/2"	8 1/2"	9 3/4	1 1/2	195 3 140	5 4 65 7	44 8 53	6 52	3 43	9 44	7 39	9 34	7 30	0 25 9									
9 1/2" 1/2"	9 1/2"	10 3/4	1 1/2	215 3 143	6 8 63 7	67 7 55	3 54	7 60	7 56	8 50	1 43	7 37	9 32 8									
10 1/2" 1/2"	10 1/2"	11 3/4	1 1/2	235 3 181	4 10 42 6	43 1 41	4 40	5 38	4 36	3 33	6 20	5 27	0 23 0	21 0								
11 1/2" 1/2"	11 1/2"	12 3/4	1 1/2	255 3 167	5 0 40 1	5 4 54	6 53	5 51	2 43	1 44	6 40	7 36	2 32	0 28 3								
12 1/2" 1/2"	12 1/2"	13 3/4	1 1/2	275 3 168	6 5 63 2	67 4 57	4 66	2 63	3 59	6 55	4 50	6 45	2 40	0 36 4								
13 1/2" 1/2"	13 1/2"	14 3/4	1 1/2	295 3 141	47 6 41	2 38	5 38	7 37	7 35	3 32	4 29	0 25	1 21	5 18 8								
14 1/2" 1/2"	14 1/2"	15 3/4	1 1/2	315 3 144	5 5 52 8	52 0 51	0 49	8 46	7 43	0 38	7 43	8 29	3 25 4									
15 1/2" 1/2"	15 1/2"	16 3/4	1 1/2	335 3 147	6 5 65 1	64 2 53	0 61	6 57	9 53	5 47	4 42	5 37	0 32 8									
16 1/2" 1/2"	16 1/2"	17 3/4	1 1/2	355 3 118	3 3 37 7	36 8 36	7 34	5 31	3 27	7 23	4 19 7											
17 1/2" 1/2"	17 1/2"	18 3/4	1 1/2	375 3 121	5 3 49 5	45 5 47	1 49	0 41	6 37	0 31	5 26	7 22 5										
18 1/2" 1/2"	18 1/2"	19 3/4	1 1/2	395 3 125	6 2 61 1	55 8 52	3 55	4 51	7 45	3 39	8 53	7 21 7										
19 1/2" 1/2"	19 1/2"	20 3/4	1 1/2	415 3 141	7 1 43 0	37 4 15	7 35	8 33	6 31	0 27	9 44	5 21	3 10 4									
20 1/2" 1/2"	20 1/2"	21 3/4	1 1/2	435 3 142	8 0 50 0	49 3 18	3 47	8 44	5 41	1 37	2 32	6 38	6 24 5									
21 1/2" 1/2"	21 1/2"	22 3/4	1 1/2	455 3 153	6 2 61 6	59 7 31	6 50	3 55	6 50	9 45	3 40	4 35	7 51 1									
22 1/2" 1/2"	22 1/2"	23 3/4	1 1/2	475 3 152	7 1 52 3	34 8 53	3 52	7 29	8 26	5 22	6 19	1 16 3										
23 1/2" 1/2"	23 1/2"	24 3/4	1 1/2	495 3 155	8 1 46 7	45 7 44	6 43	1 50	9 55	4 50	4 35	9 21 9										
24 1/2" 1/2"	24 1/2"	25 3/4	1 1/2	515 3 158	9 1 37 8	56 4 55	0 53	3 49	1 44	3 59	3 50	7 57 8										
25 1/2" 1/2"	25 1/2"	26 3/4	1 1/2	535 3 175	8 1 38 1	37 6 57	0 54	9 31	4 52	0 29	4 35	1 23 2										
26 1/2" 1/2"	26 1/2"	27 3/4	1 1/2	555 3 176	9 0 50 1	49 4 48	6 47	6 45	1 42	0 32	5 34	4 30 2										
27 1/2" 1/2"	27 1/2"	28 3/4	1 1/2	575 3 179	6 2 3 61	6 60	8 59	7 58	5 55	3 51	4 47	0 41	9 36 7									
28 1/2" 1/2"	28 1/2"	29 3/4	1 1/2	595 3 192	3 6 2 35	9 35	3 34	7 53	9 31	9 29	6 26	8 23	7 20 6									
29 1/2" 1/2"	29 1/2"	30 3/4	1 1/2	615 3 197	4 7 6 47	1 46	4 15	6 44	6 42	2 39	1 35	7 31	6 27 7									
30 1/2" 1/2"	30 1/2"	31 3/4	1 1/2	635 3 198	5 6 50	0 57	2 56	2 55	1 32	2 48	5 44	4 39	6 34 8									

DORMAN, LONG & CO. LIMITED.

ANGLES AS STRUTS.

SAFE LOADS IN TONS FOR FOUR UNEQUAL ANGLES LACED.
ENDS FIXED.

For other conditions of ends see page 65

For the Sections given the least radius of Gyration will be about $\frac{1}{2}d$, as for this to be otherwise, the distance A would have to be less than $\frac{1}{2}d$.

Size and Thickness	d	Radius of Gyration $\frac{1}{2}d$	LENGTH IN FEET																											
			6	8	10	12	14	16	18	20	22	24	26																	
6 4	111	55	111	6	105	9	107	7	103	3	98	3	95	1																
			126	157	7	153	1	149	1	145	3	142	4	117	9	113	1	108	0	102	4	96	3							
6 5	125	62	125	7	119	4	121	2	115	6	111	5	107	1	103	5	99	1	95	7	91	1	87	5	83	7	79	5		
			140	171	4	167	0	163	4	159	8	155	2	151	6	147	0	143	4	139	8	135	2	131	6	127	0	123	4	
6 6	140	70	140	8	134	1	136	3	130	7	126	1	122	5	118	9	114	3	110	7	106	1	102	5	98	9	94	3	90	7
			155	186	1	182	5	178	9	174	3	170	7	166	1	162	5	158	9	154	3	150	7	146	1	142	5	138	9	134	3
6 7	155	77	155	9	149	2	151	4	145	8	141	2	137	6	133	0	129	4	125	8	121	2	117	6	113	0	109	4	105	8
			170	201	2	197	6	193	0	189	4	185	8	181	2	177	6	173	0	169	4	165	8	161	2	157	6	153	0	149	4
6 8	170	85	170	10	164	3	166	5	160	9	156	3	152	7	148	1	144	5	140	9	136	3	132	7	128	1	124	5	120	9
			185	216	3	212	7	208	1	204	5	200	9	196	3	192	7	188	1	184	5	180	9	176	3	172	7	168	1	164	5
6 9	185	92	185	11	179	4	181	6	175	10	171	4	167	8	163	2	159	6	155	0	151	4	147	8	143	2	139	6	135	0
			200	231	4	227	8	223	2	219	6	215	0	211	4	207	8	203	2	199	6	195	0	191	4	187	8	183	2	179
6 10	200	100	200	12	194	5	196	7	190	11	186	5	182	9	178	3	174	7	170	1	166	5	162	9	158	3	154	7	150	1
			215	246	5	242	9	238	3	234	7	230	1	226	5	222	9	218	3	214	7	210	1	206	5	202	9	198	3	194	7
6 11	215	107	215	13	209	6	211	8	205	12	201	6	197	10	193	4	189	8	185	2	181	6	177	10	173	4	169	8	165	2
			230	261	6	257	10	253	4	249	8	245	2	241	6	237	10	233	4	229	8	225	2	221	6	217	10	213	4	209	8
6 12	230	115	230	14	224	7	226	9	220	13	216	7	212	11	208	5	204	9	200	3	196	7	192	11	188	5	184	9	180	3
			245	276	7	272	11	268	5	264	9	260	3	256	7	252	11	248	5	244	9	240	3	236	7	232	11	228	5	224	9
6 13	245	122	245	15	239	8	241	10	235	14	231	8	227	12	223	6	219	10	215	4	211	8	207	12	203	6	199	10	195	4
			260	291	8	287	12	283	6	279	10	275	4	271	8	267	12	263	6	259	10	255	4	251	8	247	12	243	6	239	10
6 14	260	130	260	16	254	9	256	11	250	15	246	9	242	13	238	7	234	11	230	5	226	9	222	13	218	7	214	11	210	5
			275	306	9	302	13	298	7	294	11	290	5	286	9	282	13	278	7	274	11	270	5	266	9	262	13	258	7	254	11
6 15	275	137	275	17	269	10	271	12	265	16	261	10	257	14	253	8	249	12	245	6	241	10	237	14	233	8	229	12	225	6
			290	321	10	317	14	313	8	309	12	305	6	301	10	297	14	293	8	289	12	285	6	281	10	277	14	273	8	269	12
6 16	290	145	290	18	284	11	286	13	280	17	276	11	272	15	268	9	264	13	260	7	256	11	252	15	248	9	244	13	240	7
			305	336	11	332	15	328	9	324	13	320	7	316	11	312	15	308	9	304	13	300	7	296	11	292	15	288	9	284	13
6 17	305	152	305	19	299	12	301	14	295	18	291	12	287	16	283	10	279	14	275	8	271	12	267	16	263	10	259	14	255	8
			320	351	12	347	16	343	10	339	14	335	8	331	12	327	16	323	10	319	14	315	8	311	12	307	16	303	10	299	14
6 18	320	160	320	20	314	13	316	15	310	19	306	13	302	17	298	11	294	15	290	9	286	13	282	17	278	11	274	15	270	9
			335	366	13	362	17	358	11	354	15	350	9	346	13	342	17	338	11	334	15	330	9	326	13	322	17	318	11	314	15
6 19	335	167	335	21	329	14	331	16	325	20	321	14	317	18	313	12	309	16	305	10	301	14	297	18	293	12	289	16	285	10
			350	381	14	377	18	373	12	369	16	365	10	361	14	357	18	353	12	349	16	345	10	341	14	337	18	333	12	329	16
6 20	350	175	350	22	344	15	346	17	340	21	336	15	332	19	328	13	324	17	320	11	316	15	312	19	308	13	304	17	300	11
			365	396	15	392	19	388	13	384	17	380	11	376	15	372	19	368	13	364	17	360	11	356	15	352	19	348	13	344	17
6 21	365	182	365	23	359	16	361	18	355	22	351	16	347	20	343	14	339	18	335	12	331	16	327	20	323	14	319	18	315	12
			380	411	16	407	20	403	14	399	18	395	12	391	16	387	20	383	14	379	18	375	12	371	16	367	20	363	14	359	18
6 22	380	190	380	24	374	17	376	19	370	23	366	17	362	21	358	15	354	19	350	13	346	17	342	21	338	15	334	19	330	13
			395	426	17	422	21	418	15	414	19	410	13	406	17	402	21	398	15	394	19	390	13	386	17	382	21	378	15	374	19
6 23	395	197	395	25	389	18	391	20	385	24	381	18	377	22	373	16	369	20	365	14	361	18	357	22	353	16	349	20	345	14
			410	441	18	437	22	433	16	429	20	425	14	421	18	417	22	413	16	409	20	405	14	401	18	397	22	393	16	389	20
6 24	410	205	410	26	404	19	406	21	400	25	396	19	392	23	388	17	384	21	380	15	376	19	372	23	368	17	364	21	360	15
			425	456	19	452	23	448	17	444	21	440	15	436	19	432	23	428	17	424	21	420	15	416	19	412	23	408	17	404	21
6 25	425	212	425	27	419	20	421	22	415	26	411	20	407	24	403	18	399	22	395	16	391	20	387	24	383	18	379	22	375	16
			440	471	20	467	24	463	18	459	22	455	16	451	20	447	24	443	18	439	22	435	16	431	20	427	24	423	18	419	22
6 26	440	220	440	28	434	21	436	23	430	27	426	21	422	25	418	19	414	23	410	17	406	21	402	25	398	19	394	23	390	17
			455	486	21	482	25	478	19	474	23	470	17	466	21	462	25	458	19	454	23	450	17	446	21	442	25	438	19	434	23
6 27	455	227	455	29	449	22	451	24	445	28	441	22	437	26	433	20	429	24	425	18	421	22	417	26	413	20	409	24	405	18
			470	501	22	497	26	493	20	489	24	485	18	481	22	477	26	473	20	469	24	465	18	461	22	457	26	453	20	449	24
6 28	470	235	470	30	464	23	466	25	460	29	456	23	452	27	448	21	444	25	440	19	436	23	432	27	428	21	424	25	420	19
			485	516	23	512	27	508	21	504	25	500	19	496	23	492	27	488	21	484	25	480	19	476	23	472	27	468	21	464	25
6 29	485	242	485	31	479	24	481	26	475	30	471	24	467	28	463	22	459	26	455	20	451	24	447	28	443	22	439	26	435	20
			500	531	24	527	28	523	22	519	26	515	20	511	24	507	28	503	22	499	26	495	20	491	24	487	28	483	22	479	26
6 30	500	250	500	32	494	25	496	27	490	31	486	25	482	29	478	23	474	27	470	21	466	25	462	29	458	23	454			

DORMAN, LONG & CO. LIMITED

TYPES OF BASES & CAPS FOR
STANCHIONS

FOR SMALL I BEAMS.



FOR MEDIUM I BEAMS.



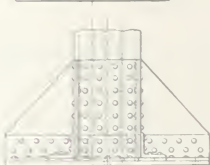
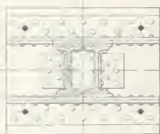
FOR LARGE I BEAMS.

DORMAN, LONG & CO. LIMITED.

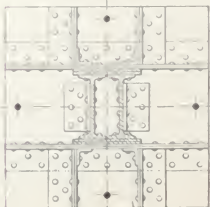
TYPES OF BASES & CAPS FOR STANCHIONS



FOR DOUBLE I BEAMS
WITH FLATS.
MEDIUM TYPE.



FOR DOUBLE I BEAMS
WITH FLATS.
LARGE TYPE.



TYPES OF BASES & CAPS FOR STANCHIONS

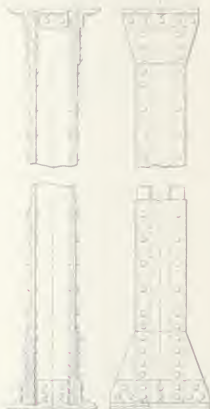


FOR I BEAMS OF DRAGONFORM SECTION

TYPES OF BASES & CAPS FOR STANCHIONS



FOR ZED BARS WITH FLATS.



FOR CHANNELS WITH FLATS.

TYPES OF JOINTS FOR STANCHIONS



FOR SINGLE I BEAMS



FOR SINGLE I BEAMS WITH PLATE



FOR LARGER I BEAMS



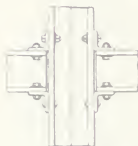
FOR BEAMS OF DIFFERENT HEIGHT

FOR DOUBLE I BEAMS
WITH PLATEFOR DOUBLE I BEAMS
WITH PLATE

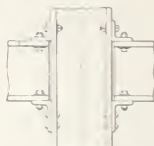
NOTE: Dimensions may be altered to suit local conditions & to suit particular requirements.

DORMAN, LONG & CO. LIMITED.

TYPE CONNECTIONS OF I BEAMS TO BEAM STANCHIONS



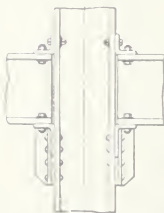
Flange Connections.



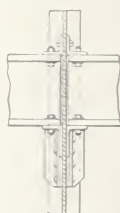
Flange Connections.



SIMPLE ANGLE STOOLS AND TOP CLEATS FOR I BEAMS.



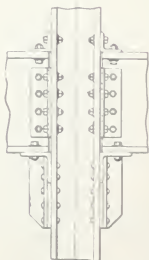
Flange Connections



Web Connections.



BUILT STOOLS AND TOP CLEATS FOR I BEAMS



Flange Connections.



BUILT STOOLS, SIDE AND TOP CLEATS FOR I BEAMS.

(where greater rigidity is required)

SECTIONAL ELEVATION OF THE CONNECTION

TYPE CONNECTION OF 1 BEAM JOINTING TO BEAM JOINTING STANCHION



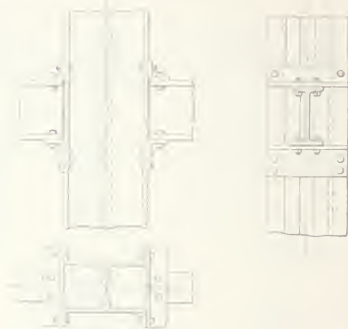
SECTIONAL ELEVATION OF THE JOINTING FOR 1 BEAM JOINTING



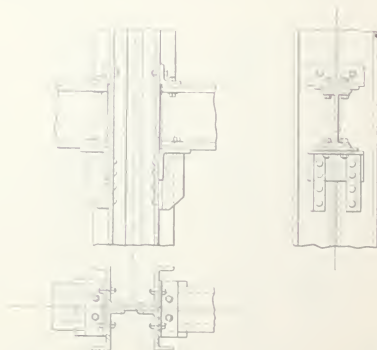
SECTIONAL ELEVATION OF THE JOINTING FOR 1 BEAM JOINTING

DORMAN, LONG & CO. LIMITED.

TYPE CONNECTIONS OF I BEAMS AND COMPOUNDS TO ZED BAR STANCHIONS



SIMPLE ANGLE STOOLS AND TOP CLEATS FOR I BEAMS.



BUILT STOOLS AND TOP CLEATS FOR I BEAM COMPOUNDS.

STANDARD CONNECTIONS FOR BEAMS.

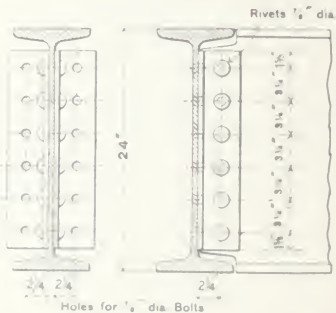
Standard Angle Cleats. - The standard angle cleats, illustrated on pages 100 to 103, have been designed for bolted field connections. They have been calculated to withstand reactions equivalent to those produced by the tabular loads on the beams, at the minimum spans given with each standard connection.

Where the reactions are greater than the above, additional support, or special connection, will be necessary.

Separators. - When two or more beams are required to be bolted together, side by side, to form a girder, cast iron separators are frequently used. They should be placed at intervals of about five or six feet, and where concentrated loads occur.

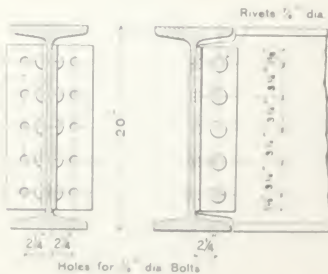
DORMAN, LONG & CO. LIMITED.

STANDARD CONNECTIONS FOR BEAMS



For
B.S.B. 24" x 7 $\frac{1}{2}$ " x 100 lbs
Min Span 22'-0"

ANGLE CLEATS 4" x 4" x $\frac{1}{2}$ " x 1'-7 $\frac{1}{2}$ " LONG. REF. NO. L¹



For
B.S.B. 20" x 7 $\frac{1}{2}$ " x 80 lbs
Min Span 19'-0"

ANGLE CLEATS 4" x 4" x $\frac{1}{2}$ " x 1'-4 $\frac{1}{4}$ " LONG. REF. NO. L²

STANDARD CONNECTIONS FOR BEAMS



For
K&B 4" x 12" x 1/2"
See Table 10-1

ANGLE CLEATS 4 - 4 x 1/2 x 12' 12' 12' 12' 12' 12' Ref. No. L1



For
K&B 4" x 12" x 1/2"
See Table 10-1

ANGLE CLEATS 6 - 6 x 1/2 x 12' 12' 12' 12' 12' 12' Ref. No. L2



For
K&B 4" x 12" x 1/2"
See Table 10-1
K&B 4" x 12" x 1/2"
See Table 10-1
K&B 4" x 12" x 1/2"
See Table 10-1
K&B 4" x 12" x 1/2"
See Table 10-1

ANGLE CLEATS 8 - 8 x 1/2 x 12' 12' 12' 12' 12' 12' Ref. No. L3

STANDARD CONNECTIONS FOR BEAMS

ANGLE CLEATS $6 \times 3 \times \frac{1}{2} \times 8 \frac{1}{2}$ LONG REF No. L6ANGLE CLEATS $6 \times 3 \times \frac{1}{2} \times 7$ LONG REF No. L7ANGLE CLEATS $6 \times 6 \times \frac{1}{2} \times 5 \frac{1}{2}$ LONG REF No. L8ANGLE CLEATS $6 \times 3 \times \frac{1}{2} \times 7$ LONG REF. No. L9

STANDARD CONNECTIONS FOR BEAMS

Diagram	Beam Size	Column Size	Notes
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm

ANGLE CLEATS 100 mm x 100 mm x 10 mm

Diagram	Beam Size	Column Size	Notes
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm

ANGLE CLEATS 100 mm x 100 mm x 10 mm

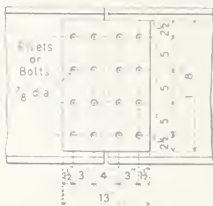
Diagram	Beam Size	Column Size	Notes
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm

ANGLE CLEATS 100 mm x 100 mm x 10 mm

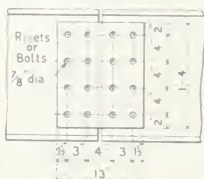
Diagram	Beam Size	Column Size	Notes
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm
	100 mm x 100 mm	100 mm x 100 mm	100 mm x 100 mm

ANGLE CLEATS 100 mm x 100 mm x 10 mm

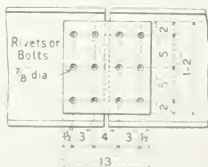
STANDARD CONNECTIONS FOR BEAMS

**FISHPLATE REF. NO. FP1**

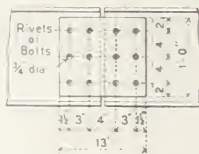
For B.S.B. 24 x 7 1/2 x 100 lbs

**FISHPLATE REF. NO. FP2**

For B.S.B. 20 x 7 1/2 x 89 lbs

**FISHPLATE REF. NO. FP3**

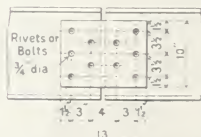
For B.S.B. 18 x 7 x 75 lbs

**FISHPLATE REF. NO. FP4**

For B.S.B. 16 x 6 x 62 lbs

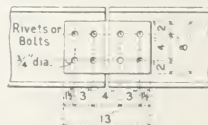
For B.S.B. 15 x 6 x 59 lbs

For B.S.B. 15 x 5 x 42 lbs

**FISHPLATE REF. NO. FP5**

For B.S.B. 14 x 6 x 57 lbs

For B.S.B. 14 x 6 x 46 lbs

**FISHPLATE REF. NO. FP6**

For B.S.B. 12 x 6 x 54 lbs

For B.S.B. 12 x 6 x 44 lbs

For D.L.B. 12 x 5 x 39 lbs

For B.S.B. 12 x 5 x 32 lbs

The above Fishplates are for beams supported at joints, and those usually kept in stock are 1/2" thick for the larger, and 3/8" thick for the smaller sizes.

FORMER, LONG & CO. LIMITED

STANDARD CONNECTIONS FOR BEAMS



FISHPLATE No. FP1
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"

FISHPLATE No. FP1

FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"



FISHPLATE No. FP2
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"

FISHPLATE No. FP2

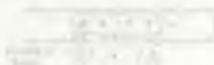
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"



FISHPLATE No. FP3
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"

FISHPLATE No. FP3

FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"



FISHPLATE No. FP4

FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"



FISHPLATE No. FP5

FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"

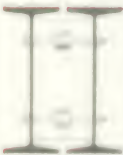



FISHPLATE No. FP6

FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"
FOR BEAM 10" x 10" x 10"

The above specifications are for beams supported as shown, and are subject to change without notice. The above specifications are for beams supported as shown, and are subject to change without notice.

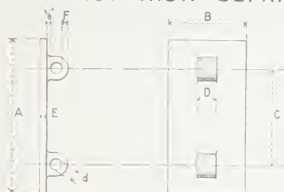
I BEAMS WITH CAST IRON SEPARATORS.

Section Mark & Size.	Span	Length of Beam	Weight of Beam	Weight of Separator	Total Weight	Depth	Flange Width	Flange Thickness	Web Thickness	Radius of Flange	Radius of Web
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10
	244	10	1000	10	1010	10	10	10	10	10	10

Notes:—The I-beams are made from steel of the best quality, and the separators are made from cast iron of the best quality. The weight of the separators is given in the column headed "Weight of Separator". The weight of the I-beams is given in the column headed "Weight of Beam". The total weight of the I-beams and separators is given in the column headed "Total Weight".

DORMAN, LONG & CO. LIMITED.

STANDARD CAST IRON SEPARATORS.



FOR USE IN BEAMS FROM 24" x 7" TO 12" x 5"

Reference No.	DIMENSIONS IN INCHES							Weight in lbs.
	A	B	C	D	E	F	d	
S ¹	19 $\frac{1}{2}$	7 $\frac{1}{2}$	13	2	$\frac{1}{2}$	$\frac{1}{2}$	1	27.10
S ²	16	7 $\frac{1}{2}$	10	2	$\frac{1}{2}$	$\frac{1}{2}$	1	22.75
S ³	14	6 $\frac{1}{2}$	9	2	$\frac{1}{2}$	$\frac{1}{2}$	1	19.23
S ⁴	12 $\frac{1}{2}$	5 $\frac{1}{2}$	8	1 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	11.78
S ⁵	11 $\frac{1}{2}$	6	7 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	10.83
S ⁶	10 $\frac{1}{2}$	6	7	1 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	10.01
S ⁷	8 $\frac{1}{2}$	6	5	1 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	8.39

FOR USE IN BEAMS FROM 10" x 8" TO 5" x 4 $\frac{1}{2}$ "

Reference No.	DIMENSIONS IN INCHES					Weight in lbs.
	A	B	E	F	d	
S ⁸	6	7 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	7.91
S ⁹	7	6 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	6.9
S ¹⁰	5 $\frac{1}{4}$	6 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	6.26
S ¹¹	6 $\frac{1}{4}$	4 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	4.3
S ¹²	5 $\frac{1}{4}$	6	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	5.1
S ¹³	5	4 $\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	4.09
S ¹⁴	3	5	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	2.92

DORMAN, LONG & CO. LIMITED.

STANDARD SPACING OF HOLES IN FLANGES OF CHANNELS, I BEAMS AND ANGLES.



Size of Flange in inches	Dimensions in inches a
4	2 ¹ / ₄
3 ¹ / ₂	2
3	1 ³ / ₄
2 ¹ / ₂	1 ¹ / ₂
2	1 ¹ / ₈



Size of Flange in inches	Centres in inches A
7 ¹ / ₂	4 ¹ / ₂
7	4
6	3 ³ / ₄
5	2 ³ / ₄
4 ¹ / ₂	2
4 ¹ / ₈	2 ¹ / ₄
4	2 ¹ / ₄
3	1



Size of Angle in inches	Dimensions in inches a
4 ¹ / ₂ x 4 ¹ / ₂	2 ¹ / ₂
4 x 4	2 ¹ / ₄
3 ¹ / ₂ x 3 ¹ / ₂	2
3 x 3	1 ³ / ₄
2 ¹ / ₂ x 2 ¹ / ₂	1 ³ / ₈
2 ¹ / ₄ x 2 ¹ / ₄	1 ¹ / ₄
2 x 2	1 ¹ / ₈
1 ⁵ / ₈ x 1 ⁵ / ₈	1
1 ¹ / ₂ x 1 ¹ / ₂	⁷ / ₈
1 ¹ / ₄ x 1 ¹ / ₄	⁵ / ₄



Size of Angle in inches	Dimensions in inches a b
8 x 8	3 3
6 x 6	2 ¹ / ₄ 2 ¹ / ₄
5 x 5	1 ³ / ₄



Size of Angle in inches	Dimensions in inches a b c
7 x 3 ¹ / ₂	2 3 2
6 ¹ / ₂ x 4 ¹ / ₂	2 2 ¹ / ₂ 2 ¹ / ₂
6 ¹ / ₂ x 3 ¹ / ₂	2 2 2
6 x 4	2 ¹ / ₄ 2 ¹ / ₄ 2 ¹ / ₄
6 x 3 ¹ / ₂	2 ¹ / ₄ 2 ¹ / ₄ 2
6 x 3	2 ¹ / ₄ 2 ¹ / ₄ 1 ¹ / ₄
5 ¹ / ₂ x 3 ¹ / ₂	2 ¹ / ₄ 2 2
5 ¹ / ₂ x 3	2 ¹ / ₄ 2 1 ³ / ₄
5 x 4	2 1 ³ / ₄ 2 ¹ / ₄
5 x 3 ¹ / ₂	2 1 ³ / ₄ 2
5 x 3	2 1 ³ / ₄ 1 ³ / ₄



Size of Angle in inches	Dimensions in inches a b
4 ¹ / ₂ x 3 ¹ / ₂	2 ¹ / ₂ 2
4 x 3 ¹ / ₂	2 ¹ / ₄ 2
4 x 3	2 ¹ / ₄ 1 ³ / ₄
3 ¹ / ₂ x 3	2 1 ¹ / ₄
3 ¹ / ₂ x 2 ¹ / ₂	2 1 ³ / ₈
3 x 2 ¹ / ₂	1 ³ / ₄ 1 ³ / ₈
3 x 2	1 ³ / ₄ 1 ¹ / ₈
2 ¹ / ₂ x 2	1 ³ / ₈ 1 ¹ / ₈
2 x 1 ¹ / ₂	1 ¹ / ₈ ⁷ / ₈

NOTES ON PLATE GIRDERS.

General Note.—On the preceding pages notes of 1. stresses and moments are given, showing the loads carried by each bar, various spaces, that which will be required, as for rivets, where the girders will be in very weak, it will sometimes be found that the most girder given in the following pages, may be used with advantage.

Tabular Loads.—The loads given in the tables, include the weights of the girders themselves, and also, in each case, obtained from the weights of the web and flanges (see Table Flanges Table). They are based on an average line, some of the load will be carried by the web, and some of the average loading area.

When it is considered advisable to adopt any other average line, say a line perpendicular to the centre line, should be found in the Table $\frac{1}{2}$.

The loads are also based on the assumption that the girder will be subject to a load, and the web will be subject to a load, and the web will be subject to a load.

Stresses.—The stresses of some girders may be obtained by means of various stress being applied to the web, and the flange angles and girders (which is the case of girder being double web, designed may be adopted, which means girder will be that obtained by using other stresses above. The stress of the web depends on the depth of the girder, the thickness of web plate, and the stresses for which the girder are required.

Curtailment of Plates.—Where it is not desirable to allow the flange plates to extend the full length of the girder, the limit to which they can be curtailed, for girders supported at both ends and having an uniformly distributed load, may be found as follows:—



Let A = total area of flange, in square inches.

a_1 = area of top plate, in square inches.

a_2 = area of two top plates, in square inches.

a_x = area of number x top plates, in square inches.

K = span of girder, in feet.

k_1 = length of top plate, in feet.

k_2 = length of second plate, in feet.

k_x = length of x th plate, in feet.

Then:

$$k_1 = \frac{K\sqrt{a_1}}{\sqrt{A}}, \quad k_2 = \frac{K\sqrt{a_2}}{\sqrt{A}}, \quad k_x = \frac{K\sqrt{a_x}}{\sqrt{A}}$$

It is customary to make the plates longer than the lengths found by the above formulae to the extent of about three pitches of rivets at each end, and the plate next to the flange angles is usually the full length of the girder.

PLATE 1. NUMBER 100

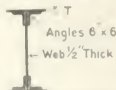
Very useful in terms of information and service.



DORMAN, LONG & CO. LIMITED.

PLATE GIRDERS.

SAFE LOADS IN TONS UNIFORMLY DISTRIBUTED.



Spans in feet	Depth over Angles 36 inches Angles 6" 6" x 1/2" Width of Flange 14"					Depth over Angles 42 inches Angles 6" 6" x 1/2" Width of Flange 14"				
	Total thickness, T, in inches, of flats in one flange					Total thickness, T, in inches, of flats in one flange				
	1/2	3/4	1	1 1/4	1 1/2	1/2	3/4	1	1 1/4	1 1/2
24	131					135				
26	171	121				185	156			
28	164	113								
30	97	106	114			107	127	138		
32	91	99	107	116		109	119	129	139	
34	85	93	101	109	117	105	112	121	131	140
36	81	89	96	103	110	97	106	115	123	132
38	76	83	90	97	104	92	100	109	117	125
40	72	79	86	92	99	88	96	103	111	119
42						83	91	98	106	113
44						80	87	94	101	108
46						76	83	90	97	103

Spans in feet	Depth over Angles 48 inches Angles 6" 6" x 1/2" Width of Flange 16"						
	Total thickness, T, in inches, of flats in one flange						
	1/2	3/4	1	1 1/4	1 1/2	1 3/4	1 1/2
30	150						
32	187	161					
34	179	151					
36	131	143	154				
38	120	130	140	157			
40	110	120	130	149	159		
42	112	122	132	143	156		
44	108	117	126	135	145	154	
46	103	112	121	130	139	147	156
48	98	107	116	124	133	141	150
50	95	103	111	119	127	136	144
52	91	99	107	114	122	130	138
54	88	95	103	110	118	126	133

NOTE.—When T exceeds 1 1/2" two flats should be used.

DORMAN, LONG & CO. LIMITED

BOX PLATE GIRDERS.

SAFE LOADS IN TONS UNIFORMLY DISTRIBUTED.



Supports 18 in. dia.

Web 1/2 in. thick.

Span in feet.	Depth over flanges 36 inches Width of Flange 14 inches.							Depth over flanges 36 inches Width of Flange 14 inches.						
	Total loadings, T, in tons, of Span in feet.							Total loadings, T, in tons, of Span in feet.						
	10	12	14	16	18	20	22	10	12	14	16	18	20	22
10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
12	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
14	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
16	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
18	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
20	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
22	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0

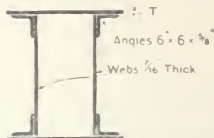
Span in feet.	Depth over flanges 36 inches Width of Flange 14 inches.							Depth over flanges 36 inches Width of Flange 14 inches.						
	Total loadings, T, in tons, of Span in feet.							Total loadings, T, in tons, of Span in feet.						
	10	12	14	16	18	20	22	10	12	14	16	18	20	22
10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
12	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
14	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
16	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
18	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
20	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
22	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0

Notes: 1. When T is in tons, the load is in tons per foot.

DORMAN, LONG & CO. LIMITED.

BOX PLATE GIRDERS.

SAFE LOADS IN TONS UNIFORMLY DISTRIBUTED.



Spans in feet	Depth over Angles 42 inches Width of Flange 24 inches								Depth over Angles 48 inches Width of Flange 24 inches							
	Total thickness, τ , in inches, of flats in one flange								Total thickness, τ , in inches, of flats in one flange							
	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	
24	210	241							257							
26	201	222	244						237	262						
28	186	207	227						220	243	266					
30	174	193	212	230					205	227	243	270				
32	163	181	198	216	234				193	213	233	253	273			
34	154	170	187	203	220	237			181	200	219	238	257	276		
36	145	161	176	192	208	224	239		171	189	207	225	243	261	279	
38	137	152	167	182	197	212	227		162	179	196	213	230	247	264	
40	131	145	159	173	187	201	215		154	170	186	203	219	235	251	
42	124	138	151	165	178	192	205		147	162	177	193	208	224	239	
44	119	131	144	157	170	183	196		140	155	169	184	199	214	228	
46	113	126	138	150	163	175	187		134	148	162	176	190	204	218	
48	109	121	132	144	156	168	179		128	142	155	169	182	196	209	
50									123	136	149	162	175	188	201	
52									118	131	143	156	168	181	193	
54									114	126	138	150	162	174	186	

NOTE.—When τ exceeds $\frac{3}{4}$ ", two flats should be used.

DORMAN, LONG & THE LONDON

NOTES ON ROOFS.

APPROXIMATE WEIGHTS PER SQUARE FOOT OF BRICKS
AREA COVERED, TWO STEEL ROOF PRINCIPALS WITH THE
VARIOUS FORMS OF CORRUGATED SHEETINGS FOLLOW.

Roof covered with corrugated sheet with steel joists
 12" x 12" spaced 24" apart 12.5
 12" x 12" spaced 24" apart 12.5
 12" x 12" spaced 24" apart 12.5
 12" x 12" spaced 24" apart 12.5

PRESSURE OF WIND ON WALLS (SEE FORMULA)

A = Area of wall in sq. ft. perpendicular to wind
 B = Velocity of wind in miles per hour
 W = Pressure in pounds per sq. ft. on wall
 P = Pressure in pounds per sq. ft. on roof
 D = Distance in feet from corner of wall to point of interest

PRESSURE OF WIND ON ROOFS WHERE THE VELOCITY
OF WIND IS 100 MPH.

Angle of Wind	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
1	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18
2	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18
3	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

PRESSURES OF WIND ON ROOFS

Angle of Roof	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
W = P	1.00	0.98	0.96	0.94	0.92	0.90	0.88	0.86	0.84	0.82	0.80	0.78	0.76	0.74	0.72	0.70	0.68	0.66	0.64
W = P	1.00	0.98	0.96	0.94	0.92	0.90	0.88	0.86	0.84	0.82	0.80	0.78	0.76	0.74	0.72	0.70	0.68	0.66	0.64
D = P	0.50	0.48	0.46	0.44	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14

PROPORTIONS OF ROOFS

Proportion of length to half span	Angle		Proportion of length of Rafter		Proportion of length to half span	Angle		Proportion of length to Rafter	
	Deg.	Min.	In length	To half span		Deg.	Min.	In length	To half span
1.1	40	0	1.0000	0.9902	1.1	40	0	1.0000	0.9902
1.2	48	0	1.0000	0.9802	1.2	48	0	1.0000	0.9802
1.3	56	0	1.0000	0.9702	1.3	56	0	1.0000	0.9702

Other proportions, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9, 11.0, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 12.0, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 13.0, 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9, 14.0, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 15.0, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8, 15.9, 16.0, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 17.0, 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 18.0, 18.1, 18.2, 18.3, 18.4, 18.5, 18.6, 18.7, 18.8, 18.9, 19.0, 19.1, 19.2, 19.3, 19.4, 19.5, 19.6, 19.7, 19.8, 19.9, 20.0, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9, 21.0, 21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7, 21.8, 21.9, 22.0, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 22.9, 23.0, 23.1, 23.2, 23.3, 23.4, 23.5, 23.6, 23.7, 23.8, 23.9, 24.0, 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.9, 25.0, 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 25.9, 26.0, 26.1, 26.2, 26.3, 26.4, 26.5, 26.6, 26.7, 26.8, 26.9, 27.0, 27.1, 27.2, 27.3, 27.4, 27.5, 27.6, 27.7, 27.8, 27.9, 28.0, 28.1, 28.2, 28.3, 28.4, 28.5, 28.6, 28.7, 28.8, 28.9, 29.0, 29.1, 29.2, 29.3, 29.4, 29.5, 29.6, 29.7, 29.8, 29.9, 30.0, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 30.8, 30.9, 31.0, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6, 31.7, 31.8, 31.9, 32.0, 32.1, 32.2, 32.3, 32.4, 32.5, 32.6, 32.7, 32.8, 32.9, 33.0, 33.1, 33.2, 33.3, 33.4, 33.5, 33.6, 33.7, 33.8, 33.9, 34.0, 34.1, 34.2, 34.3, 34.4, 34.5, 34.6, 34.7, 34.8, 34.9, 35.0, 35.1, 35.2, 35.3, 35.4, 35.5, 35.6, 35.7, 35.8, 35.9, 36.0, 36.1, 36.2, 36.3, 36.4, 36.5, 36.6, 36.7, 36.8, 36.9, 37.0, 37.1, 37.2, 37.3, 37.4, 37.5, 37.6, 37.7, 37.8, 37.9, 38.0, 38.1, 38.2, 38.3, 38.4, 38.5, 38.6, 38.7, 38.8, 38.9, 39.0, 39.1, 39.2, 39.3, 39.4, 39.5, 39.6, 39.7, 39.8, 39.9, 40.0, 40.1, 40.2, 40.3, 40.4, 40.5, 40.6, 40.7, 40.8, 40.9, 41.0, 41.1, 41.2, 41.3, 41.4, 41.5, 41.6, 41.7, 41.8, 41.9, 42.0, 42.1, 42.2, 42.3, 42.4, 42.5, 42.6, 42.7, 42.8, 42.9, 43.0, 43.1, 43.2, 43.3, 43.4, 43.5, 43.6, 43.7, 43.8, 43.9, 44.0, 44.1, 44.2, 44.3, 44.4, 44.5, 44.6, 44.7, 44.8, 44.9, 45.0, 45.1, 45.2, 45.3, 45.4, 45.5, 45.6, 45.7, 45.8, 45.9, 46.0, 46.1, 46.2, 46.3, 46.4, 46.5, 46.6, 46.7, 46.8, 46.9, 47.0, 47.1, 47.2, 47.3, 47.4, 47.5, 47.6, 47.7, 47.8, 47.9, 48.0, 48.1, 48.2, 48.3, 48.4, 48.5, 48.6, 48.7, 48.8, 48.9, 49.0, 49.1, 49.2, 49.3, 49.4, 49.5, 49.6, 49.7, 49.8, 49.9, 50.0, 50.1, 50.2, 50.3, 50.4, 50.5, 50.6, 50.7, 50.8, 50.9, 51.0, 51.1, 51.2, 51.3, 51.4, 51.5, 51.6, 51.7, 51.8, 51.9, 52.0, 52.1, 52.2, 52.3, 52.4, 52.5, 52.6, 52.7, 52.8, 52.9, 53.0, 53.1, 53.2, 53.3, 53.4, 53.5, 53.6, 53.7, 53.8, 53.9, 54.0, 54.1, 54.2, 54.3, 54.4, 54.5, 54.6, 54.7, 54.8, 54.9, 55.0, 55.1, 55.2, 55.3, 55.4, 55.5, 55.6, 55.7, 55.8, 55.9, 56.0, 56.1, 56.2, 56.3, 56.4, 56.5, 56.6, 56.7, 56.8, 56.9, 57.0, 57.1, 57.2, 57.3, 57.4, 57.5, 57.6, 57.7, 57.8, 57.9, 58.0, 58.1, 58.2, 58.3, 58.4, 58.5, 58.6, 58.7, 58.8, 58.9, 59.0, 59.1, 59.2, 59.3, 59.4, 59.5, 59.6, 59.7, 59.8, 59.9, 60.0, 60.1, 60.2, 60.3, 60.4, 60.5, 60.6, 60.7, 60.8, 60.9, 61.0, 61.1, 61.2, 61.3, 61.4, 61.5, 61.6, 61.7, 61.8, 61.9, 62.0, 62.1, 62.2, 62.3, 62.4, 62.5, 62.6, 62.7, 62.8, 62.9, 63.0, 63.1, 63.2, 63.3, 63.4, 63.5, 63.6, 63.7, 63.8, 63.9, 64.0, 64.1, 64.2, 64.3, 64.4, 64.5, 64.6, 64.7, 64.8, 64.9, 65.0, 65.1, 65.2, 65.3, 65.4, 65.5, 65.6, 65.7, 65.8, 65.9, 66.0, 66.1, 66.2, 66.3, 66.4, 66.5, 66.6, 66.7, 66.8, 66.9, 67.0, 67.1, 67.2, 67.3, 67.4, 67.5, 67.6, 67.7, 67.8, 67.9, 68.0, 68.1, 68.2, 68.3, 68.4, 68.5, 68.6, 68.7, 68.8, 68.9, 69.0, 69.1, 69.2, 69.3, 69.4, 69.5, 69.6, 69.7, 69.8, 69.9, 70.0, 70.1, 70.2, 70.3, 70.4, 70.5, 70.6, 70.7, 70.8, 70.9, 71.0, 71.1, 71.2, 71.3, 71.4, 71.5, 71.6, 71.7, 71.8, 71.9, 72.0, 72.1, 72.2, 72.3, 72.4, 72.5, 72.6, 72.7, 72.8, 72.9, 73.0, 73.1, 73.2, 73.3, 73.4, 73.5, 73.6, 73.7, 73.8, 73.9, 74.0, 74.1, 74.2, 74.3, 74.4, 74.5, 74.6, 74.7, 74.8, 74.9, 75.0, 75.1, 75.2, 75.3, 75.4, 75.5, 75.6, 75.7, 75.8, 75.9, 76.0, 76.1, 76.2, 76.3, 76.4, 76.5, 76.6, 76.7, 76.8, 76.9, 77.0, 77.1, 77.2, 77.3, 77.4, 77.5, 77.6, 77.7, 77.8, 77.9, 78.0, 78.1, 78.2, 78.3, 78.4, 78.5, 78.6, 78.7, 78.8, 78.9, 79.0, 79.1, 79.2, 79.3, 79.4, 79.5, 79.6, 79.7, 79.8, 79.9, 80.0, 80.1, 80.2, 80.3, 80.4, 80.5, 80.6, 80.7, 80.8, 80.9, 81.0, 81.1, 81.2, 81.3, 81.4, 81.5, 81.6, 81.7, 81.8, 81.9, 82.0, 82.1, 82.2, 82.3, 82.4, 82.5, 82.6, 82.7, 82.8, 82.9, 83.0, 83.1, 83.2, 83.3, 83.4, 83.5, 83.6, 83.7, 83.8, 83.9, 84.0, 84.1, 84.2, 84.3, 84.4, 84.5, 84.6, 84.7, 84.8, 84.9, 85.0, 85.1, 85.2, 85.3, 85.4, 85.5, 85.6, 85.7, 85.8, 85.9, 86.0, 86.1, 86.2, 86.3, 86.4, 86.5, 86.6, 86.7, 86.8, 86.9, 87.0, 87.1, 87.2, 87.3, 87.4, 87.5, 87.6, 87.7, 87.8, 87.9, 88.0, 88.1, 88.2, 88.3, 88.4, 88.5, 88.6, 88.7, 88.8, 88.9, 89.0, 89.1, 89.2, 89.3, 89.4, 89.5, 89.6, 89.7, 89.8, 89.9, 90.0, 90.1, 90.2, 90.3, 90.4, 90.5, 90.6, 90.7, 90.8, 90.9, 91.0, 91.1, 91.2, 91.3, 91.4, 91.5, 91.6, 91.7, 91.8, 91.9, 92.0, 92.1, 92.2, 92.3, 92.4, 92.5, 92.6, 92.7, 92.8, 92.9, 93.0, 93.1, 93.2, 93.3, 93.4, 93.5, 93.6, 93.7, 93.8, 93.9, 94.0, 94.1, 94.2, 94.3, 94.4, 94.5, 94.6, 94.7, 94.8, 94.9, 95.0, 95.1, 95.2, 95.3, 95.4, 95.5, 95.6, 95.7, 95.8, 95.9, 96.0, 96.1, 96.2, 96.3, 96.4, 96.5, 96.6, 96.7, 96.8, 96.9, 97.0, 97.1, 97.2, 97.3, 97.4, 97.5, 97.6, 97.7, 97.8, 97.9, 98.0, 98.1, 98.2, 98.3, 98.4, 98.5, 98.6, 98.7, 98.8, 98.9, 99.0, 99.1, 99.2, 99.3, 99.4, 99.5, 99.6, 99.7, 99.8, 99.9, 100.0, 100.1, 100.2, 100.3, 100.4, 100.5, 100.6, 100.7, 100.8, 100.9, 101.0, 101.1, 101.2, 101.3, 101.4, 101.5, 101.6, 101.7, 101.8, 101.9, 102.0, 102.1, 102.2, 102.3, 102.4, 102.5, 102.6, 102.7, 102.8, 102.9, 103.0, 103.1, 103.2, 103.3, 103.4, 103.5, 103.6, 103.7, 103.8, 103.9, 104.0, 104.1, 104.2, 104.3, 104.4, 104.5, 104.6, 104.7, 104.8, 104.9, 105.0, 105.1, 105.2, 105.3, 105.4, 105.5, 105.6, 105.7, 105.8, 105.9, 106.0, 106.1, 106.2, 106.3, 106.4, 106.5, 106.6, 106.7, 106.8, 106.9, 107.0, 107.1, 107.2, 107.3, 107.4, 107.5, 107.6, 107.7, 107.8, 107.9, 108.0, 108.1, 108.2, 108.3, 108.4, 108.5, 108.6, 108.7, 108.8, 108.9, 109.0, 109.1, 109.2, 109.3, 109.4, 109.5, 109.6, 109.7, 109.8, 109.9, 110.0, 110.1, 110.2, 110.3, 110.4, 110.5, 110.6, 110.7, 110.8, 110.9, 111.0, 111.1, 111.2, 111.3, 111.4, 111.5, 111.6, 111.7, 111.8, 111.9, 112.0, 112.1, 112.2, 112.3, 112.4, 112.5, 112.6, 112.7, 112.8, 112.9, 113.0, 113.1, 113.2, 113.3, 113.4, 113.5, 113.6, 113.7, 113.8, 113.9, 114.0, 114.1, 114.2, 114.3, 114.4, 114.5, 114.6, 114.7, 114.8, 114.9, 115.0, 115.1, 115.2, 115.3, 115.4, 115.5, 115.6, 115.7, 115.8, 115.9, 116.0, 116.1, 116.2, 116.3, 116.4, 116.5, 116.6, 116.7, 116.8, 116.9, 117.0, 117.1, 117.2, 117.3, 117.4, 117.5, 117.6, 117.7, 117.8, 117.9, 118.0, 118.1, 118.2, 118.3, 118.4, 118.5, 118.6, 118.7, 118.8, 118.9, 119.0, 119.1, 119.2, 119.3, 119.4, 119.5, 119.6, 119.7, 119.8, 119.9, 120.0, 120.1, 120.2, 120.3, 120.4, 120.5, 120.6, 120.7, 120.8, 120.9, 121.0, 121.1, 121.2, 121.3, 121.4, 121.5, 121.6, 121.7, 121.8, 121.9, 122.0, 122.1, 122.2, 122.3, 122.4, 122.5, 122.6, 122.7, 122.8, 122.9, 123.0, 123.1, 123.2, 123.3, 123.4, 123.5, 123.6, 123.7, 123.8, 123.9, 124.0, 124.1, 124.2, 124.3, 124.4, 124.5, 124.6, 124.7, 124.8, 124.9, 125.0, 125.1, 125.2, 125.3, 125.4, 125.5, 125.6, 125.7, 125.8, 125.9, 126.0, 126.1, 126.2, 126.3, 126.4, 126.5, 126.6, 126.7, 126.8, 126.9, 127.0, 127.1, 127.2, 127.3, 127.4, 127.5, 127.6, 127.7, 127.8, 127.9, 128.0, 128.1, 128.2, 128.3, 128.4, 128.5, 128.6, 128.7, 128.8, 128.9, 129.0, 129.1, 129.2, 129.3, 129.4, 129.5, 129.6, 129.7, 129.8, 129.9, 130.0, 130.1, 130.2, 130.3, 130.4, 130.5, 130.6, 130.7, 130.8, 130.9, 131.0, 131.1, 131.2, 131.3, 131.4, 131.5, 131.6, 131.7, 131.8, 131.9, 132.0, 132.1, 132.2, 132.3, 132.4, 132.5, 132.6, 132.7, 132.8, 132.9, 133.0, 133.1, 133.2, 133.3, 133.4, 133.5, 133.6, 133.7, 133.8, 133.9, 134.0, 134.1, 134.2, 134.3, 134.4, 134.5, 134.6, 134.7, 134.8, 134.9, 135.0, 135.1, 135.2, 135.3, 135.4, 135.5, 135.6, 135.7, 135.8, 135.9, 136.0, 136.1, 136.2, 136.3, 136.4, 136.5, 136.6, 136.7, 136.8, 136.9, 137.0, 137.1, 137.2, 137.3, 137.4, 137.5, 137.6, 137.7, 137.8, 137.9, 138.0, 138.1, 138.2, 138.3, 138.4, 138.5, 138.6, 138.7, 138.8, 138.9, 139.0, 139.1, 139.2, 139.3, 139.4, 139.5, 139.6, 139.7, 139.8, 139.9, 140.0, 140.1, 140.2, 140.3, 140.4, 140.5, 140.6, 140.7, 140.8, 140.9, 141.0, 141.1, 141.2, 141.3, 141.4, 141.5, 141.6, 141.7, 141.8, 141.9, 142.0, 142.1, 142.2, 142.3, 142.4, 142.5, 142.6, 142.7, 142.8, 142.9, 143.0, 143.1, 143.2, 143.3, 143.4, 143.5, 143.6, 143.7, 143.8, 143.9, 144.0, 144.1, 144.2, 144.3, 144.4, 144.5, 144.6, 144.7, 144.8, 144.9, 145.0, 145.1, 145.2, 145.3, 145.4, 145.5, 145.6, 145.7, 145.8, 145.9, 146.0, 146.1, 146.2, 146.3, 146.4, 146.5, 146.6, 146.7, 146.8, 146.9, 147.0, 147.1, 147.2, 147.3, 147.4, 147.5, 147.6, 147.7, 147.8, 147.9, 148.0, 148.1, 148.2, 148.3, 148.4, 148.5, 148.6, 148.7, 148.8, 148.9, 149.0, 149.1, 149.2, 149.3, 149.4, 149.5, 149.6, 149.7, 149.8, 149.9, 150.0, 150.1, 150.2, 150.3, 150.4, 150.5, 150.6, 150.7, 150.8, 150.9, 151.0, 151.1, 151.2, 151.3, 151.4, 151.5, 151.6, 151.7, 151.8, 151.9, 152.0, 152.1, 152.2, 152.3, 152.4, 152.5, 152.6, 152.7, 152.8, 152.9, 153.0, 153.1, 153.2, 153.3, 153.4, 153.5, 153.6, 153.7, 153.8, 153.9, 154.0, 154.1, 154.2, 154.3, 154.4, 154.5, 154.6, 154.7, 15

DORMAN, LONG & CO. LIMITED.

ROOF TRUSSES.

Table of Co-efficients for the determination of Stresses, and Lengths of Members, in Roof Trusses, for any span, the proportion of height to half the span being 1. 2.

To find the Stress in any Member—

- Let S = Span between the points of intersection of the Rafter and Tie.
 L = Total Dead Load carried by the Truss, including its own weight.
 W = Total Wind Pressure resisted by the Truss, acting on one side of roof, and normal to its surface.
 T = Total Stress required.
 Then $T = L$ multiplied by Co-efficient for Dead Load + $(W$ multiplied by Co-efficient for Wind Pressure).

In Trusses of larger spans it is sometimes advisable to provide for expansion, in which case the co-efficient for wind pressure corresponding to "one end free" should be used.

To find the length of any Member between points of intersection;—

Multiply S by the length co-efficient for that member.

NOTE.—The following Stress Co-efficients have been calculated on the assumption that the roof purlins occur over the points of intersection of the various members with the rafter, when such is not the case, bending is produced in the rafter which necessitates further calculation, or allowance being made when deciding its section.

STRESS CO-EFFICIENTS				
Member of Truss	Dead Load	Normal Wind Pressure		Length Co-efficients
		Both ends fixed	One end free	
FIG. 1.				
ab	738	1875		27950
bd	737	975		27950
bc	223	500		18750
ac	750	975		31250
ce	500	419		18750
cd	280	559		31250
FIG. 2.				
ab	703	1742		18634
bd	702	840		18634
dc	733	1742		18634
bc	179	401		16797
dc	179	401		16797
ac	833	1765		31250
cf	500	419		18750
ce	333	746		31250
FIG. 3.				
ab	778	1725	1725	13975
bd	922	1725	1725	13975
df	866	1725	1725	17975
fh	811	1725	1725	13975
bc	112	250	250	06987
fg	112	250	250	06987
de	224	500	500	13975
ac	875	1288	1397	15625
ce	750	978	1118	15625
ej	500	419	559	18750
cd	125	279	279	15625
dg	125	279	279	15625
gh	375	838	838	15625
eg	250	559	559	15625

NOTE.—Heavy lines indicate Compression and light lines Tension Members.

DORMAN, LONG & CO. LIMITED.

ROOF TRUSSES.

Table of Co-efficients for the determination of Stresses, &c

Member of Truss	STRESS CO-EFFICIENTS			Length Co-efficients
	Dead Load	Normal Wind Pressure		
		Both ends fixed	One end free	
g h	990	700	700	0.0007
h i	1000	700	700	0.0007
i j	990	700	700	0.0007
j k	980	700	700	0.0007
k l	970	700	700	0.0007
l m	960	700	700	0.0007
m n	950	700	700	0.0007
n o	940	700	700	0.0007
o p	930	700	700	0.0007
p q	920	700	700	0.0007
q r	910	700	700	0.0007
r s	900	700	700	0.0007
s t	890	700	700	0.0007
t u	880	700	700	0.0007
u v	870	700	700	0.0007
v w	860	700	700	0.0007
w x	850	700	700	0.0007
x y	840	700	700	0.0007
y z	830	700	700	0.0007
z a	820	700	700	0.0007
a b	810	700	700	0.0007
b c	800	700	700	0.0007
c d	790	700	700	0.0007
d e	780	700	700	0.0007
e f	770	700	700	0.0007
f g	760	700	700	0.0007
g h	750	700	700	0.0007
h i	740	700	700	0.0007
i j	730	700	700	0.0007
j k	720	700	700	0.0007
k l	710	700	700	0.0007
l m	700	700	700	0.0007
m n	690	700	700	0.0007
n o	680	700	700	0.0007
o p	670	700	700	0.0007
p q	660	700	700	0.0007
q r	650	700	700	0.0007
r s	640	700	700	0.0007
s t	630	700	700	0.0007
t u	620	700	700	0.0007
u v	610	700	700	0.0007
v w	600	700	700	0.0007
w x	590	700	700	0.0007
x y	580	700	700	0.0007
y z	570	700	700	0.0007
z a	560	700	700	0.0007
a b	550	700	700	0.0007
b c	540	700	700	0.0007
c d	530	700	700	0.0007
d e	520	700	700	0.0007
e f	510	700	700	0.0007
f g	500	700	700	0.0007
g h	490	700	700	0.0007
h i	480	700	700	0.0007
i j	470	700	700	0.0007
j k	460	700	700	0.0007
k l	450	700	700	0.0007
l m	440	700	700	0.0007
m n	430	700	700	0.0007
n o	420	700	700	0.0007
o p	410	700	700	0.0007
p q	400	700	700	0.0007
q r	390	700	700	0.0007
r s	380	700	700	0.0007
s t	370	700	700	0.0007
t u	360	700	700	0.0007
u v	350	700	700	0.0007
v w	340	700	700	0.0007
w x	330	700	700	0.0007
x y	320	700	700	0.0007
y z	310	700	700	0.0007
z a	300	700	700	0.0007
a b	290	700	700	0.0007
b c	280	700	700	0.0007
c d	270	700	700	0.0007
d e	260	700	700	0.0007
e f	250	700	700	0.0007
f g	240	700	700	0.0007
g h	230	700	700	0.0007
h i	220	700	700	0.0007
i j	210	700	700	0.0007
j k	200	700	700	0.0007
k l	190	700	700	0.0007
l m	180	700	700	0.0007
m n	170	700	700	0.0007
n o	160	700	700	0.0007
o p	150	700	700	0.0007
p q	140	700	700	0.0007
q r	130	700	700	0.0007
r s	120	700	700	0.0007
s t	110	700	700	0.0007
t u	100	700	700	0.0007
u v	90	700	700	0.0007
v w	80	700	700	0.0007
w x	70	700	700	0.0007
x y	60	700	700	0.0007
y z	50	700	700	0.0007
z a	40	700	700	0.0007
a b	30	700	700	0.0007
b c	20	700	700	0.0007
c d	10	700	700	0.0007
d e	0	700	700	0.0007
e f	-10	700	700	0.0007
f g	-20	700	700	0.0007
g h	-30	700	700	0.0007
h i	-40	700	700	0.0007
i j	-50	700	700	0.0007
j k	-60	700	700	0.0007
k l	-70	700	700	0.0007
l m	-80	700	700	0.0007
m n	-90	700	700	0.0007
n o	-100	700	700	0.0007
o p	-110	700	700	0.0007
p q	-120	700	700	0.0007
q r	-130	700	700	0.0007
r s	-140	700	700	0.0007
s t	-150	700	700	0.0007
t u	-160	700	700	0.0007
u v	-170	700	700	0.0007
v w	-180	700	700	0.0007
w x	-190	700	700	0.0007
x y	-200	700	700	0.0007
y z	-210	700	700	0.0007
z a	-220	700	700	0.0007
a b	-230	700	700	0.0007
b c	-240	700	700	0.0007
c d	-250	700	700	0.0007
d e	-260	700	700	0.0007
e f	-270	700	700	0.0007
f g	-280	700	700	0.0007
g h	-290	700	700	0.0007
h i	-300	700	700	0.0007
i j	-310	700	700	0.0007
j k	-320	700	700	0.0007
k l	-330	700	700	0.0007
l m	-340	700	700	0.0007
m n	-350	700	700	0.0007
n o	-360	700	700	0.0007
o p	-370	700	700	0.0007
p q	-380	700	700	0.0007
q r	-390	700	700	0.0007
r s	-400	700	700	0.0007
s t	-410	700	700	0.0007
t u	-420	700	700	0.0007
u v	-430	700	700	0.0007
v w	-440	700	700	0.0007
w x	-450	700	700	0.0007
x y	-460	700	700	0.0007
y z	-470	700	700	0.0007
z a	-480	700	700	0.0007
a b	-490	700	700	0.0007
b c	-500	700	700	0.0007
c d	-510	700	700	0.0007
d e	-520	700	700	0.0007
e f	-530	700	700	0.0007
f g	-540	700	700	0.0007
g h	-550	700	700	0.0007
h i	-560	700	700	0.0007
i j	-570	700	700	0.0007
j k	-580	700	700	0.0007
k l	-590	700	700	0.0007
l m	-600	700	700	0.0007
m n	-610	700	700	0.0007
n o	-620	700	700	0.0007
o p	-630	700	700	0.0007
p q	-640	700	700	0.0007
q r	-650	700	700	0.0007
r s	-660	700	700	0.0007
s t	-670	700	700	0.0007
t u	-680	700	700	0.0007
u v	-690	700	700	0.0007
v w	-700	700	700	0.0007

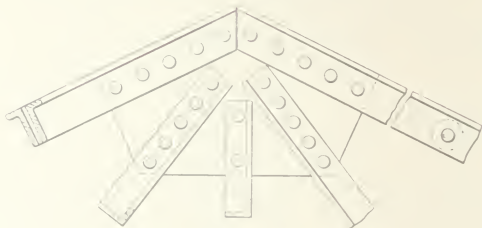
FIG. 4.

FIG. 5.

NOTE.—Heavy lines indicate Compression and light lines Tension Members.

DORMAN, LONG & CO. LIMITED.

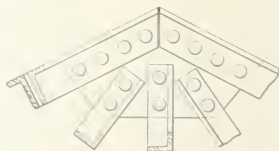
TYPE CONNECTIONS FOR ROOF TRUSSES



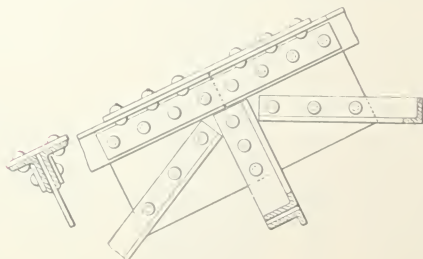
Detail at "q" Fig 4 & "k" Fig 5.



Detail at "d," Fig 1.



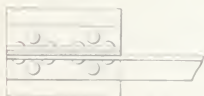
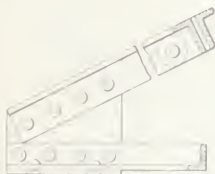
Detail at "h," Fig 3



Detail at "h" Fig 4 & "e," Fig 5

DORMAN, LONG & CO. LIMITED.

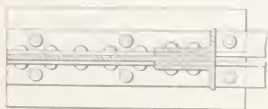
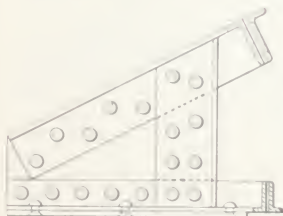
TYPE CONNECTIONS FOR ROOF TRUSSES



Detail at "k" Figs 1 & 2



Detail at "d" Figs 3 & 4



Detail at "a" Figs. 4 & 5



Detail at "c" Figs. 1, 3 & 4



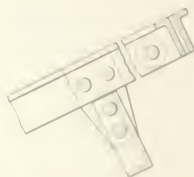
Detail at "r" Fig. 4 & "l" Fig. 5

DORMAN, LONG & CO. LIMITED.

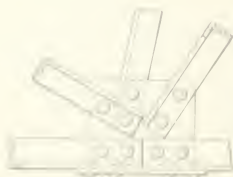
TYPE CONNECTIONS FOR ROOF TRUSSES



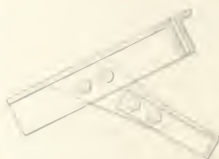
Detail at 'a' Figs 3, & 4



Detail at 'b' Figs 1, 3 & 4



Detail at 'c' Fig 2



Detail at 'd' Figs 3 & 5



Purlin Cleat Connections

DORMAN, LONG & CO. LIMITED.

NOTES ON TROUGHING.

Troughing, as illustrated on the following pages, commands a leading place on the market; and can be recommended for a variety of purposes. When used for road bridges, it not only affords a watertight superstructure for carrying the road metalling, but, in most cases, dispenses with the use of cross girders and frequently with the main girders also. In railway bridges it frequently takes the place of cross girders, railbearers and timber planking; at the same time forming a safer floor in case of derailment. A maximum amount of headway under the bridge is attained, and a saving in cost effected. The smaller sections will be found especially useful for the decking of piers, floors of warehouses, ceilings of subways, strong rooms, etc.

The troughing is usually riveted, before dispatched, in sections of three, thus:—



The site connections are generally made with rivets, but bolted connections may be adopted when found advisable; either method affording easy means of erection.

Single troughs, as illustrated on pages 26 and 27, are frequently used as roof gutters, and permit of the supports being placed at long distances apart.

POWELL, LONG & CO. LIMITED.

Dimensions, Properties, &c.—Tables of the various sections of built-up bridging are shown on pages 141 to 143, and tables giving dimensions, weights, and other details will be found on pages 144 to 146. The properties have been carefully calculated in this volume, giving all data and constant factors being taken into consideration.

The tables also include the weight of the bridging steel, and are calculated from the section modulus of the section "X" shown on diagrams. They are based on a stress of 10 tons per sq. inch.

It will thus be seen that the section modulus is used, which is a general rule, and the weight of steel is given.

Expansion.—The expansion of the various kinds of bridging is given, and the expansion of the various sections, as given on pages 147 to 149.

General Remarks.—The cost of building various sections of built-up bridging are shown on pages 150 to 152.

Illustrations of Bridge Design.—Illustrations showing the use of bridging in the design of bridge work will be found on later pages.

DORMAN, LONG & CO. LIMITED

STEEL TROUGHING



O MINIMUM

weight per sq. ft. of covered area = 13.4 lbs.

Section Modulus = 4.92



O MAXIMUM

weight per sq. ft. of covered area = 19.08 lbs.

Section Modulus = 8.55



A MINIMUM

weight per sq. ft. of covered area = 17.61 lbs.

Section Modulus = 6.4



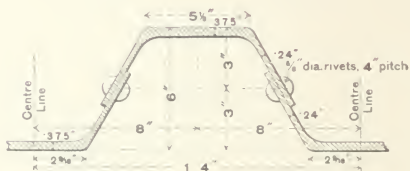
A MAXIMUM

weight per sq. ft. of covered area = 23.1 lbs.

Section Modulus = 11.05

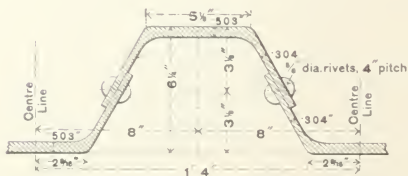
FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133.

STEEL TROUGHING

**B MINIMUM**

weight per sq. ft. of covered area = 21.8 lbs

Section Modulus = 13.5

**B MAXIMUM**

weight per sq. ft. of covered area = 28 lbs

Section Modulus = 17.5

FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133.

DORMAN, LONG & CO. LIMITED

STEEL TROUGHING



C MINIMUM

weight per sq ft of covered area = 24.52 lbs

Section Modulus = 21.62



C MAXIMUM

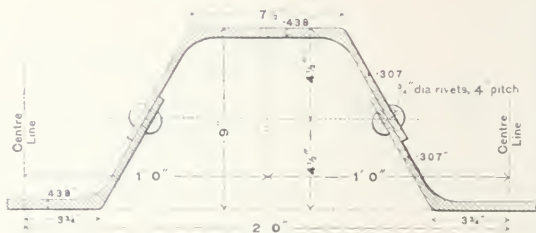
weight per sq ft of covered area = 32.97 lbs

Section Modulus = 30.6

FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133.

DORMAN, LONG & CO. LIMITED.

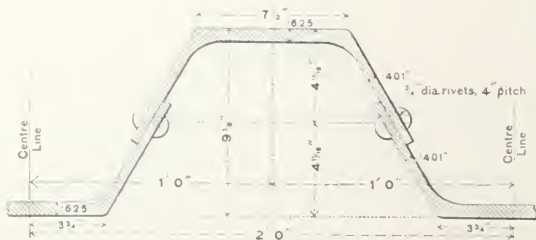
STEEL TROUGHING



C1 MINIMUM

weight per sq ft of covered area = 26.26 lbs

Section Modulus = 36.57



C1 MAXIMUM

weight per sq ft of covered area = 35.02 lbs

Section Modulus = 51.45

FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133.

DOHMAN, LONG & CO. LIMITED.

STEEL TROUGHING



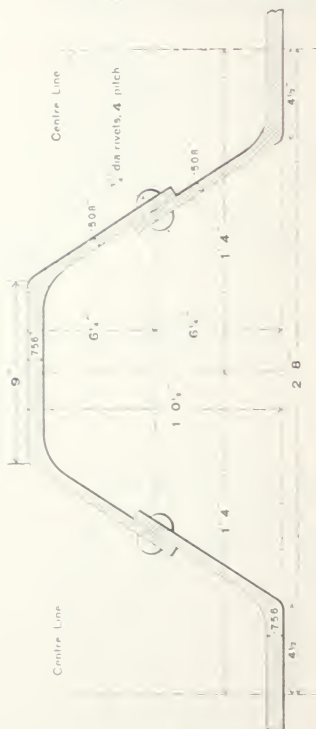
D MINIMUM

Weight per sq. ft. of covered area = 28.76 lbs.
 Netted Surface = 72.85

FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133

DORMAN, LONG & CO. LIMITED.

STEEL TROUGHING



D MEDIUM

Weight per sq ft of covered area 40.6 lbs

Section Modulus 103.54

D MEDIUM

FOR PROPERTIES AND SAFE LOADS SEE PAGES 132 & 133.

DORMAN, LONG & CO. LIMITED

STEEL TROUGHING



D MAXIMUM

Weight per sq. ft. of material area = 61.85 lb
 Section modulus = 1.35 in

FOR PROPERTIES AND SAFE LOADS SEE PAGES 122 & 123.

DORMAN, LONG & CO. LIMITED

STEEL TROUGHING



E MAXIMUM

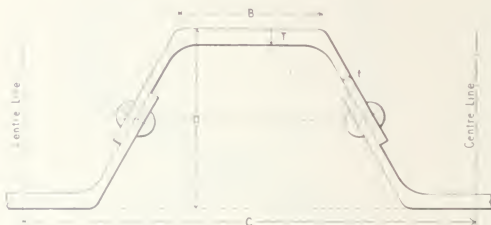
1980 - 1981

E MAXIMUM

FOR PROPERTIES AND SAFE LOADS SEE PAGE 134

DORMAN, LONG & CO. LIMITED.

STEEL TROUGHING.



DIMENSIONS AND PROPERTIES.

Reference Mark	Weight per sq. ft. of covered area in lbs.	Centres		Depths		Width of Flange	Thick-ness of Flange	Thick-ness of Web	Rivets		Section Modulus for width "0"
		C	D	C	D	B	T	t	Dia.	Pitch	
D Max.	51.83	2 8 1	1	9	1.000	.636	$\frac{3}{4}$	4	135	80	
D Med.	40.50	2 8 1	0 $\frac{1}{2}$	9	.756	.508	$\frac{3}{4}$	4	103	54	
D Min.	28.78	2 8 1	0	9	.500	.367	$\frac{3}{4}$	4	72	67	
O' Max.	35.02	2 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$	.625	.401	$\frac{3}{4}$	4	51	45	
O' Min.	26.26	2 0	9	7 $\frac{1}{2}$	.438	.307	$\frac{3}{4}$	4	36	57	
O Max.	32.97	1 8	7 $\frac{1}{2}$	6	.616	.400	$\frac{3}{8}$	4	30	60	
O Min.	24.52	1 8	7	6	.438	.300	$\frac{3}{8}$	4	21	62	
B. Max.	28.00	1 4	6 $\frac{1}{4}$	5 $\frac{1}{8}$	.503	.304	$\frac{3}{8}$	4	17	50	
B. Min.	21.80	1 4	6	5 $\frac{1}{8}$	.375	.240	$\frac{3}{8}$	4	13	50	
A Max.	23.10	1 2	5 $\frac{1}{4}$	4 $\frac{1}{2}$	.453	.247	$\frac{1}{2}$	4	11	05	
A Min.	17.61	1 2	5	4 $\frac{1}{2}$	.336	.188	$\frac{1}{2}$	4	8	40	
O. Max.	19.06	1 0	4 $\frac{1}{4}$	4	.386	.184	$\frac{1}{2}$	4	6	55	
O. Min.	13.40	1 0	4	4	.267	.125	$\frac{1}{2}$	4	4	92	

FOODS OF THE FUTURE, INC. 143 E. 14TH ST. NEW YORK, N.Y. 10003

STEEL TROUGHING

SAFE LOAD IN TONS PER SQUARE FOOT.

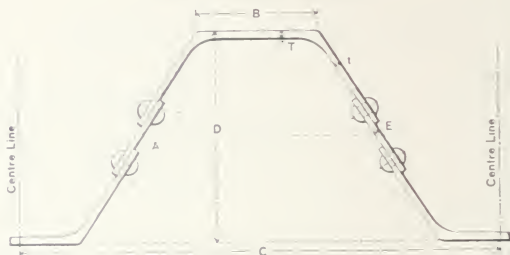
Reference No.	APAR IN FEET													
	0	50	100	150	200	250	300	350	400	450	500	550	600	650
D. Max.			44.1	50.1	56.1	62.1	68.1	74.1	80.1	86.1	92.1	98.1	104.1	110.1
D. Min.			35.7	40.7	45.7	50.7	55.7	60.7	65.7	70.7	75.7	80.7	85.7	90.7
D. Mod.			40.9	45.9	50.9	55.9	60.9	65.9	70.9	75.9	80.9	85.9	90.9	95.9
D ² Max.			194.9	251.9	308.9	365.9	422.9	479.9	536.9	593.9	650.9	707.9	764.9	821.9
D ² Min.			128.2	162.2	196.2	230.2	264.2	298.2	332.2	366.2	400.2	434.2	468.2	502.2
C. Max.			34.3	38.3	42.3	46.3	50.3	54.3	58.3	62.3	66.3	70.3	74.3	78.3
C. Min.			25.9	28.9	31.9	34.9	37.9	40.9	43.9	46.9	49.9	52.9	55.9	58.9
B. Max.			21.7	24.7	27.7	30.7	33.7	36.7	39.7	42.7	45.7	48.7	51.7	54.7
B. Min.			15.3	17.3	19.3	21.3	23.3	25.3	27.3	29.3	31.3	33.3	35.3	37.3
A. Max.			12.7	14.7	16.7	18.7	20.7	22.7	24.7	26.7	28.7	30.7	32.7	34.7
A. Min.			9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.3	18.3	19.3	20.3
O. Max.			6.3	7.3	8.3	9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.3
S. Min.			3.3	4.3	5.3	6.3	7.3	8.3	9.3	10.3	11.3	12.3	13.3	14.3

SAFE DISTRIBUTED LOANS in Force for 2000

[illegible]

DORMAN, LONG & CO. LIMITED.

STEEL TROUGHING.



DIMENSIONS AND PROPERTIES.

Reference Mark	Weight per sq. ft. of covered area in lbs.	Centres		Depths	Width of Flange	Thickness of Flange	Thickness of Web	Flats		Rivets		Section Modulus for width "C"
		C	D	B	T	t	A	E	Dia.	Pitch		
E. Max.	56.76	ft. in. 3 0	ft. in. 15 1/4	ins. 9	ins. 1.000	ins. .636	ins. 7	ins. 5/8	ins. 7/8	4	203.87	
E. Min.	32.6	3 0	13 3/4	9	.500	.367	7	3/8	7/8	4	104.61	

SAFE LOADS IN CWTs. PER SQUARE FOOT.

Reference Mark	SPAN IN FEET													
	14	16	18	20	22	24	26	28	30	32	34	36	38	40
E. Max.	30.0	23.0	18.2	14.7	12.2	10.2	8.7	7.6	6.5	5.7	5.1	4.5	4.1	3.7
E. Min.	15.4	11.8	9.3	7.5	6.2	5.2	4.4	3.8	3.3	2.9	2.6	2.3	2.1	1.9

SAFE DISTRIBUTED LOADS IN TONS FOR WIDTH "C."

Reference Mark	SPAN IN FEET													
	14	16	18	20	22	24	26	28	30	32	34	36	38	40
E. Max.	63.1	55.2	49.1	44.2	40.2	36.8	34.0	31.8	29.4	27.6	26.0	24.5	23.2	22.1
E. Min.	32.4	28.3	25.2	22.7	20.6	18.9	17.4	16.2	15.1	14.2	13.3	12.6	11.9	11.3

D. H. B. & C. CO. CLEVELAND.

APPLICATION OF "C MAX" SECTION TO SINGLE LINE RAILWAY



STANDARD IN CLASS 12-1111111111111111

For full details of this design see 1111111111111111

This design is for a 1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

1111111111111111

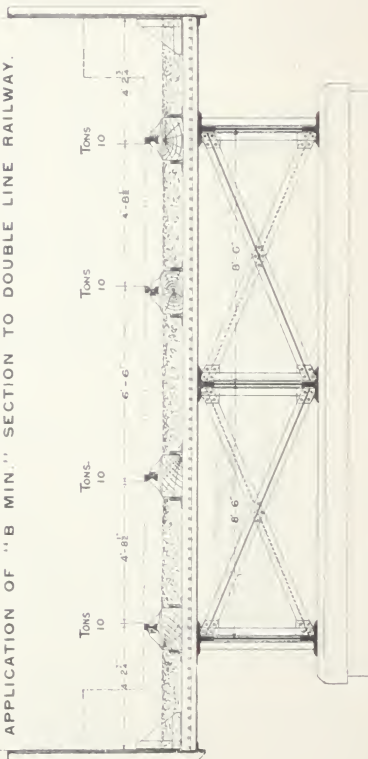
1111111111111111

1111111111111111

1111111111111111

1111111111111111

APPLICATION OF "B MIN." SECTION TO DOUBLE LINE RAILWAY.



STRENGTH OF FLOOR AS SHEWN ABOVE.

Live Load (wheel load 10 Tons) distributed over 4 Widths,
 "C" = 5 ft. 4 in.

Dead Load per square foot = 125 lbs.

Total Dead Load on 4 Widths "C" $8' \times 5' 33'' \times 125 = 2,338$ Tons.
 2240

Bending Moment $10 \times 3 \cdot 12 \times 4 \cdot 88 \times 12''$

due to Live Load $\frac{8}{8}$

Bending Moment $2 \cdot 33 \times 8' \times 12''$

due to Dead Load $\frac{8}{8}$

Total

228 38 mch tons

Modulus of 4 Widths "C" $4 \times 13 \cdot 5 = 54$.

Stress = $\frac{228 \cdot 38}{54} = 4 \cdot 75$ Tons per square mch.

DORMAN, LONG & CO. LIMITED.

APPLICATION OF "E MAX" SECTION TO DOUBLE LINE RAILWAY

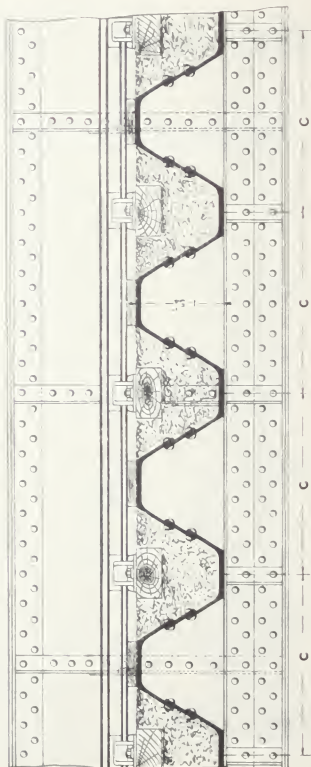


STANDARD SECTION OF RAILWAY TRACK

For full details of the "E MAX" section of railway track, see the following table:

Item	Quantity	Weight	Notes
Rails	100	100	Standard section of railway track
Sleepers	100	100	Standard section of railway track
Ballast	100	100	Standard section of railway track
Gravel	100	100	Standard section of railway track
Concrete	100	100	Standard section of railway track
Steel	100	100	Standard section of railway track
Timber	100	100	Standard section of railway track
Bricks	100	100	Standard section of railway track
Plaster	100	100	Standard section of railway track
Paint	100	100	Standard section of railway track
Other	100	100	Standard section of railway track

APPLICATION OF "E MAX." SECTION TO DOUBLE LINE RAILWAY WITH CROSS SLEEPERS.



STRENGTH OF FLOOR AS SHEWN ABOVE FOR 25' 0" SPAN.

Live Load (wheel load 10 Tons) distributed over 2 Widths,
"C" = 6ft. 6in.

Dead Load per square foot = 131 lbs.

Total Dead Load on
2 Widths "C" = $25 \times 6 \times 131.5 = 8.8$ Tons.
2240

Bending Moment
due to Live Load 640 9.35 - 10 5 12" 1651 2 inch tons
Bending Moment
due to Dead Load 8.8 25 12 330.0 " " "

Total 1981.2 " "

Modulus of 2 Widths "C" = 2 203.87 - 407.74.

Stress $\frac{1981.2}{407.74} = 4.85$ Tons per square inch.

APPLICATION OF THE MAX. SECTION TO PUBLIC ROAD BRIDGE



SECTION OF ROAD BRIDGE, SHOWING THE MAX. SECTION

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

THE ROAD BRIDGE IS 100 FEET LONG

DORMAN, LONG & CO, LIMITED.



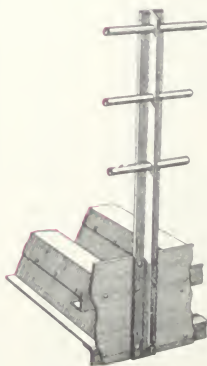
A



B



C



D



E

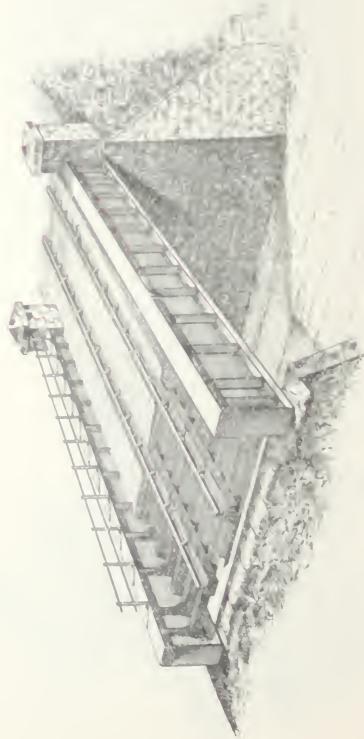
TYPES OF HAND RAILING.

SECTION OF THE GREAT WALL OF CHINA, AS DESCRIBED BY THE CHINESE.



SECTION OF THE GREAT WALL OF CHINA, AS DESCRIBED BY THE CHINESE.

DORMAN, LONG & CO. LIMITED.



TYPE OF THROUGH SPAN FOR SINGLE LINE RAILWAY

DORMAN, LONG & CO. LIMITED.



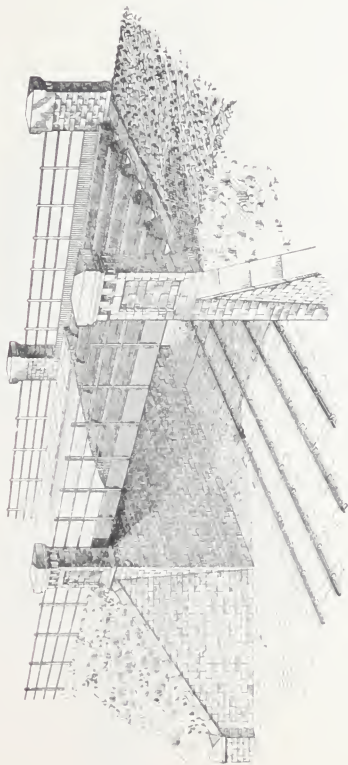
TYPE OF THROUGH SPAN FOR DOUBLE LINE RAILWAY

DORMAN, LONG & CO. LIMITED.



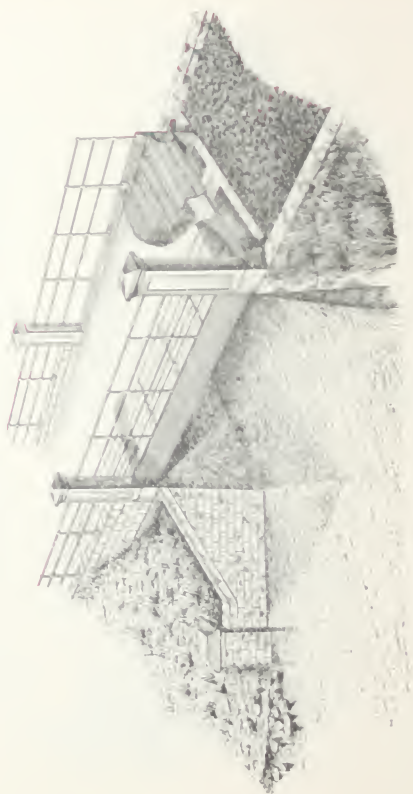
TYPE OF PUBLIC ROAD BRIDGE OF LARGE SPAN

DORMAN, LONG & CO. LIMITED.



TYPE OF PUBLIC ROAD BRIDGE WITHOUT MAIN GIRDERS.

DORMAN, LONG & CO., LIMITED.



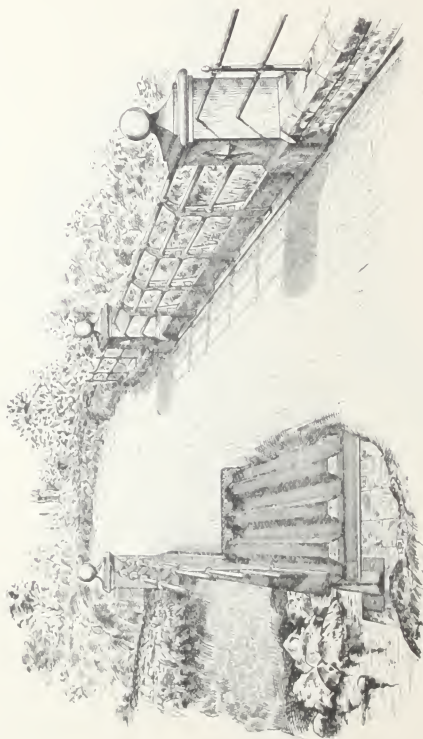
TYPE OF HIGHWAY BRIDGE.

DORMAN, LONG & CO. LIMITED



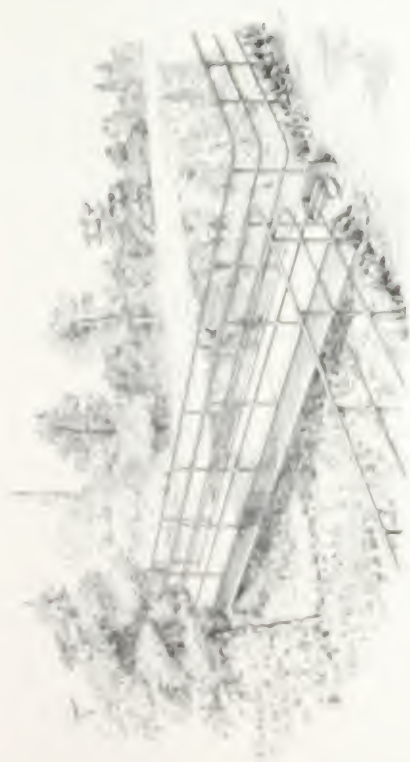
TYPE OF HIGHWAY BRIDGE.

DORMAN, LONG & CO. LIMITED



TYPE OF LIGHT CARRIAGE BRIDGE.

HOBMAN, LONG & CO. LIMITED.



TYPE OF FOOT BRIDGE



DORMAN, LONG & CO. LIMITED.

TELEGRAMS "NAMROD, MIDDLESBROUGH"

SHEET DEPARTMENT

AYRTON ROLLING MILLS,
MIDDLESBROUGH,
ENGLAND

ROLLING MILLS WITH GALVANIZING AND
CORRUGATING SHOPS.

STEEL AND IRON SHEETS

Corrugated Curved and Plain

REQUISITE FITTINGS OF ALL DESCRIPTIONS.

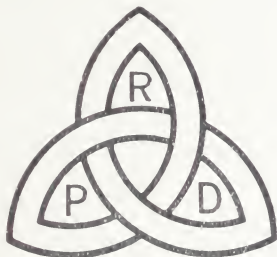
LONDON OFFICE -
23 LEADENHALL STREET, E.C.

TELEGRAMS -
"TREFILEUR LONDON"



DORMAN, LONG & CO, LIMITED.

BRANDS.



LYRE BIRD.



BRAND.



DIAMOND

STEEL SHEET PILING FOR COASTAL DEFENSE

APPROXIMATE NUMBER OF GALVANIZED CORRUGATED SHEETS PER TON.

Size	Thickness	12	14	16	18	20	22
12 ft. x 1/2 in.	1/2 in.	100	110	120	130	140	150
	3/4 in.	110	120	130	140	150	160
12 ft. x 3/4 in.	3/4 in.	120	130	140	150	160	170
	1 in.	130	140	150	160	170	180
12 ft. x 1 in.	1 in.	140	150	160	170	180	190
	1 1/4 in.	150	160	170	180	190	200
12 ft. x 1 1/4 in.	1 1/4 in.	160	170	180	190	200	210
	1 1/2 in.	170	180	190	200	210	220
12 ft. x 1 1/2 in.	1 1/2 in.	180	190	200	210	220	230
	1 3/4 in.	190	200	210	220	230	240
12 ft. x 1 3/4 in.	1 3/4 in.	200	210	220	230	240	250
	2 in.	210	220	230	240	250	260
12 ft. x 2 in.	2 in.	220	230	240	250	260	270
	2 1/4 in.	230	240	250	260	270	280
12 ft. x 2 1/4 in.	2 1/4 in.	240	250	260	270	280	290
	2 1/2 in.	250	260	270	280	290	300
12 ft. x 2 1/2 in.	2 1/2 in.	260	270	280	290	300	310
	2 3/4 in.	270	280	290	300	310	320
12 ft. x 2 3/4 in.	2 3/4 in.	280	290	300	310	320	330
	3 in.	290	300	310	320	330	340
12 ft. x 3 in.	3 in.	300	310	320	330	340	350
	3 1/4 in.	310	320	330	340	350	360

Based on 26 lb. per sq. ft. of sheet piling, 12 ft. long, 12 in. wide, and 1/2 in. thick.

DORMAN, LONG & CO. LIMITED.

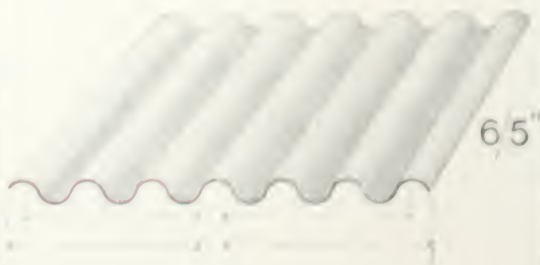
APPROXIMATE NUMBER OF GALVANIZED
CORRUGATED SHEETS PER TON.

8'	8½'	9'	9½'	10'	11'	12'	Corrugation	Size
44		..					8 3'	16 B. G.
37							10 3'	"
							5 5'	18 B. G.
54	51	48	45	43			8 3'	"
							6 4	"
48	45	42	40	38			7 4	"
46	43	41	39	37			6 5	"
							10 3'	"
71	67	63	60	57			8 3'	20 B. G.
							6 4"	"
61	57	54	51	49			7 4'	"
59	56	53	50	47			10 3"	"
87	82	77	73	69	63		8 3"	22 B. G.
73	68	65	61	53			10 3	"
100	98	93	88	84	76	70	8 3'	24 B. G.
96	90	85	81	77			9 3	"
88	83	78	74	70			10 3	"
139	131	124	117	111			8 3	26 B. G.
127	120	113	107	101			9 3	"
116	109	103	98	93			10 3	"
150							8 3"	28 B. G.
137							9 3"	"
125							10 3"	"

Flat Sheets 30" wide count the same as 8½" corrugation, and 36" wide same as 10½" corrugation.

DORMAN, LONG & CO. LIMITED.

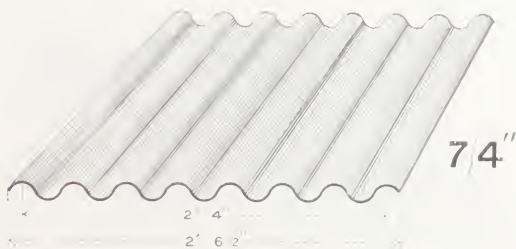
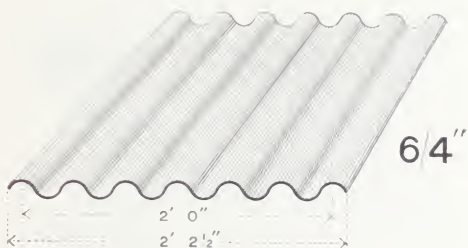
CORRUGATED SHEETS.



GAUGES 16, 18 AND 20 B.G.

DORMAN, LONG & CO. LIMITED.

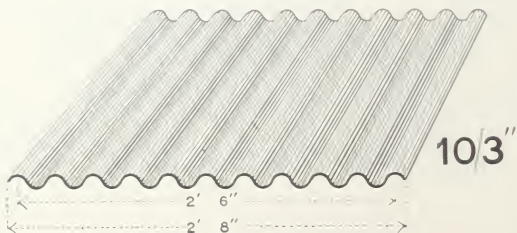
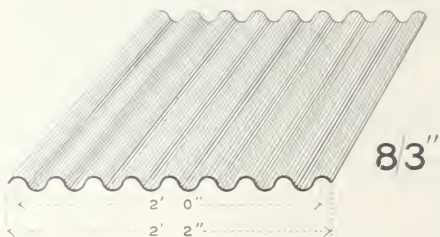
CORRUGATED SHEETS.



GAUGES 16, 18 AND 20 B.G.

DORMAN, LONG & CO. LIMITED.

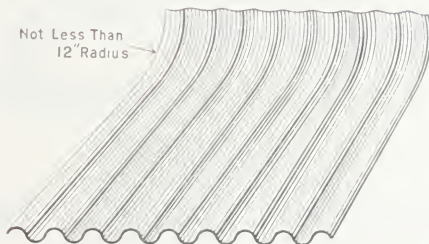
CORRUGATED SHEETS.



GAUGES 16, 18, 20, 22, 24, 26 AND 28 B.G.

DORMAN, LONG & CO. LIMITED.

CURVED CORRUGATED SHEETS.



8 3	OR 10 3	FROM 16 TO 26 GAUGE.
5 5	„ 6 5	„ 16 „ 20 „



8 3	OR 10 3	FROM 16 TO 26 GAUGE.
5 5	„ 6 5	„ 16 „ 20 „

DORMAN, LONG & CO. LIMITED.

GALVANIZED GUTTERS AND DOWN PIPES. GAUGE 16 TO 26.

SOCKET



ANGLE



HALF ROUND



STOP END



GIRTH 10 TO 36

LENGTH ABOUT 6 0

O G GUTTER



SECTION



GIRTH 10 TO 36

LENGTH ABOUT 6 0

ANGLE



STOP END



SOCKET



DORMAN, LONG & CO. LIMITED.

GALVANIZED GUTTERS AND DOWN PIPES.

BEADED GUTTER.



GIRTH 10 TO 36 GAUGE 24 LENGTH ABOUT 9 FT.

MOULDED O G ANGLE.



STAMPED O G GUTTER, WITH SLIP JOINTS SECTION



GIRTH 10 TO 36 GAUGE 24 LENGTH ABOUT 8 FT.

FOUNTAIN HEAD



DOWN PIPE

DIAMETER 3 TO 12 GAUGE 20 TO 26
LENGTH ABOUT 6 FT.
16 & 18 GAUGE IN SHORTER LENGTHS

SHOE



DORMAN, LONG & CO. LIMITED.

GALVANIZED RIDGES AND LOUVRE BLADES.



Girth 12" to 36 . Gauge 16 to 26. Length about 6' 0".



Girth 12" to 36 . Gauge 16 to 26. Length about 6' 0".



16 Gauge up to $\frac{1}{8}$ " thick, maximum length 6' 0".
 Under 16 Gauge, " " 8' 0".



Girth 11" .—16 Gauge up to $\frac{1}{8}$ " thick, maximum length 6' 0".
 Under 16 Gauge, " " 8' 0".



Girth 11".—16 Gauge up to $\frac{1}{8}$ " thick, maximum length 6' 0".
 Under 16 Gauge, " " 8' 0".

DORMAN, LONG & CO. LIMITED.

GALVANIZED FITTINGS.



Weight of Rivets.

$\frac{3}{8}$ "	$\times \frac{1}{4}$ "	- 57	Gross to 1 cwt.
$\frac{1}{2}$ "	$\times \frac{1}{4}$ "	- 52	" "
$\frac{5}{8}$ "	$\times \frac{1}{4}$ "	- 48	" "



Weight of Bolts and Nuts.

$1\frac{1}{4}$ "	$\times \frac{1}{4}$ "	- 24	Gross to 1 cwt.
$1\frac{1}{2}$ "	$\times \frac{1}{4}$ "	- 22	" "
$\frac{3}{4}$ "	$\times \frac{1}{4}$ "	- 31	" "
$\frac{1}{2}$ "	$\times \frac{1}{4}$ "	- 32	" "



$2\frac{1}{2}$ "	- 22	Gross to 1 cwt.
3"	- 19	" "



$2\frac{1}{4}$ "	- 24	Gross to 1 cwt.
$2\frac{1}{2}$ "	- 21	" "
3"	- 16	" "



4	$\times \frac{5}{16}$ "	diameter	-	$5\frac{1}{2}$	Gross to 1 cwt.
$4\frac{1}{2}$	$\times \frac{5}{16}$ "	"	-	5	" "
5	$\times \frac{5}{16}$ "	"	-	$4\frac{1}{2}$	" "
4	$\times \frac{3}{8}$ "	"	-	4	" "
$4\frac{1}{2}$	$\times \frac{3}{8}$ "	"	-	$3\frac{1}{2}$	" "
5	$\times \frac{3}{8}$ "	"	-	3	" "



18 Gross to 1 cwt.



Curved

For $\frac{1}{4}$ " Rivets
and Nails:

57 Gross to 1 cwt. 11 Gross to 1 cwt.



DORMAN, LONG & CO. LIMITED.

TELEGRAMS: "RODS, MIDDLESBROUGH."

WIRE & ROD DEPARTMENT

CLEVELAND WIRE WORKS,
MIDDLESBROUGH,
ENGLAND

ROLLING MILLS, WIRE DRAWING,
AND
GALVANIZING SHOPS.

LONDON OFFICE
23 LEADENHALL STREET, E.C.

TELEGRAMS
"TREFLEUR, LONDON."



DORMAN, LONG & CO LIMITED

THE
CLEVELAND WIRE MILLS

MANUFACTURERS

ALL KINDS OF WIRE FOR ALL PURPOSES.

Wire Ropes Rolled or drawn to any size or length to specification.

5 CWT. Pieces, without Weld or Joint, guaranteed if required.



TRADE MARK
WILLOW TREE BRAND
REGISTERED

SPECIAL MAKE OF PATENT AND PLOUGH
STEEL ROPE WIRE.

DORMAN, LONG & CO. LIMITED.

THE CLEVELAND WIRE MILLS.

SPECIALITIES :

Galvanized Telegraph (High Conductivity) Wire.

Galvanized Telephone Wire.

Signal Strand, etc.

Galvanized Patent Steel Hawser Wire to Lloyd's
Specification.

Bright Patent and Plough Steel Rope Wire of all grades
and of Highest Tensile Strength and Ductility.

DRAWN AND ANNEALED PIT GUIDE RODS,
WELDS GUARANTEED.

The Cleveland Wire Mills are also makers of
all kinds of

IRON, STEEL & CHARCOAL WIRE OF ALL
SIZES & GRADES FOR ALL PURPOSES.

DORMAN, LONG & CO. LIMITED

GALVANIZED STEEL BARB FENCING WIRE

Style	Description	Weight of		Length of 31 1/2 lbs. or 21 lbs.
		150 yds	100 yds	
	2 Point Ordinary			
	Barbs round flat Wire only, 200 yds.	19	335	600 yards 539 meters
	2 Point Thickest			
	Barbs round flat Wire only, 200 yds.	21	370	633 yards 487 meters
	4 Point Ordinary			
	Barbs round flat Wire only, 200 yds.	30	352	569 yards 512 meters
	4 Point Thickest			
	Barbs round flat Wire only, 200 yds.	28	440	498 yards 410 meters
	1 Point Ordinary			
	Barbs round flat Wire only, 200 yds.	39	352	569 yards 512 meters
	1 Point Thickest			
	Barbs round flat Wire only, 200 yds.	25	440	498 yards 410 meters

DORMAN, LONG & CO. LIMITED.

GALVANIZED FENCING STRAND.

THREE PLY				FIVE PLY			
Gauge	Size of Single Wire	Weight per Mile, Lbs.	Length per Cwt., Yards	Gauge	Size of Single Wire	Weight per Mile, Lbs.	Length per Cwt., Yards
0	8	1100	179	0	10½	1070	184
1	8½	994	198	1	11½	870	226
2	9	800	246	2	12	778	253
3	10	704	280	3	13	607	324
4	11	580	340	4	13½	530	372
5	12	466	423	5	14	460	428
6	12½	414	476	6	15	372	530
7	13¼	340	580	7	16	294	670
8	14	275	717	8	16½	250	788
9	15	223	884	9	17	225	876
10	16	176	1120	10	18	165	1194
FOUR PLY				SEVEN PLY			
0	9½	1063	185	½	7½	2840	69
1	10½	855	231	1½	9	2085	95
2	11	773	255	0	11½	1211	162
3	12	620	318	1½	12	1085	182
4	12½	552	356	1	12½	963	205
5	13¼	454	434	2	13	850	232
6	14	367	537	3	13½	741	266
7	14½	330	593	4	14¼	610	323
8	15½	265	743	5	15	520	379
9	16¼	220	896	6	16	410	481
10	17	180	1095	7	16½	351	560
				8	17¼	292	675
				9	18	230	853
				10	18½	195	1011

DORMAN, LONG & CO. LIMITED.

IMPERIAL STANDARD WIRE GAUGE.

TABLE OF SIZES, WEIGHTS, LENGTHS, AND BREAKING STRAINS OF STEEL WIRE

As adopted by the Iron and Steel Wire Manufacturers' Association (January) 1904

Diameter Inches	Size on Wire Gauge	Diameter		Sectional area in square inches	Approximate weight of			Approximate length of		Approximate breaking strain	
		Deol of an inch	Milli- metres		100 Yards	Mile	Kilo- metre	Cwt	100 Kilos	25 Tons per sq. in.	35 Tons per sq. in.
					lbs.	tons.	tons.	5,000 ft.	1,000 m.	lbs.	tons.
1/16	500	12.7	1.635	300.13	55.22	2.02	76	156	1000	1000	5000
1/8	464	11.3	1.6910	172.55	30.37	1.08	66	128	446	1327	1140
3/16	432	11.0	1.4637	149.87	26.24	1.65	75	147	320	1140	1140
1/4	400	10.2	1.3568	130.07	22.54	1.40	87	172	202	925	925
5/16	372	9.4	1.0689	110.61	19.60	1.21	101	139	608	532	532
3/8	344	8.8	1.0810	96.35	17.06	1.06	115	159	538	477	477
1/2	312	8.2	1.0244	84.65	14.79	.91	128	175	485	432	432
	500	7.6	.07669	72.04	1.260	.76	156	300	2800	3540	3540
	475	7.0	.06882	60.37	1.075	.67	183	360	2500	3000	3000
3/4	452	6.4	.04827	50.35	.898	.56	220	445	2038	2510	2510
	432	5.9	.04227	41.07	.738	.47	250	502	2364	2315	2315
	412	5.4	.03630	33.97	.635	.39	311	612	1977	1977	1977
1	402	4.9	.03256	28.42	.518	.32	380	742	1621	1621	1621
	375	4.6	.02432	24.77	.430	.27	422	850	1502	1446	1446
	360	4.1	.02011	20.45	.360	.22	546	1075	1125	1375	1375
	344	3.7	.01621	16.59	.292	.18	675	1329	911	1279	1279
1 1/8	328	3.3	.01287	13.92	.231	.14	824	1661	729	1008	1008
	312	3.0	.00957	10.90	.180	.11	1040	2047	532	828	828
	304	2.6	.00850	9.65	.162	.09	1233	2545	475	696	696
1 1/4	288	2.3	.00663	6.75	.119	.07	1663	3254	375	521	521
	280	2.0	.00563	5.11	.09	.06	2336	4305	281	384	384
1 1/2	272	1.8	.00407	4.12	.075	.04	2699	5355	237	318	318
1 3/4	264	1.6	.00322	3.29	.058	.03	3416	6724	199	268	268
	256	1.4	.00248	2.50	.044	.02	4275	8662	158	192	192
2	248	1.2	.00181	1.83	.035	.02	5072	10775	101	141	141
	240	1.0	.00126	1.27	.0254	.01	6745	12714	70	96	96
	232	0.9	.00102	1.03	.0198	.01	8334	15736	57	79	79
2 1/4	224	0.8	.00080	.819	.0142	.00	10663	20754	45	63	63
	216	0.7	.00062	.628	.0104	.00	13128	25128	34.4	48.2	48.2
	208	0.6	.00045	.461	.0071	.00	1603	3220	25.2	35.3	35.3
2 3/4	200	0.55	.00038	.387	.0052	.00	1974	38908	20.2	29.3	29.3
	200	0.5	.00031	.320	.0038	.00	2477	48251	17.6	24.6	24.6
3	208	0.45	.00025	.259	.0036	.00	2984	58003	14.2	19.9	19.9
	204	0.4	.00021	.215	.0031	.00	3521	70298	11.8	16.6	16.6
	200	0.37	.00017	.175	.0026	.00	4277	85777	9.6	13.5	13.5
	200	0.35	.00014	.143	.0021	.00	5162	10393	8.1	11.4	11.4
	200	0.32	.00012	.123	.0017	.00	6166	12711	6.8	9.5	9.5

DORMAN, LONG & CO. LIMITED.

TABLE OF TENSILE STRAIN OF WIRE.

From 3 to 126 Inch for 1 Ton per Square Inch for each
One Thousandth Part of an Inch

TENSILE OF WIRE IN LBS. FOR 1 TON (2240 LBS.) PER EACH INCH

Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.
265	153 3	265	123 6	23	93 1	195	67 7	16	45
264	157 3	264	122 6	229	92 3	194	66 2	159	44 5
263	156 2	263	121 7	228	91 5	193	65 6	158	43 9
262	155 2	262	120 8	227	90 7	192	64 8	157	43 4
261	154 2	261	119 8	226	89 9	191	64 2	156	42 8
260	153 1	260	118 9	225	89 01	19	63 6	155	42 3
259	152 1	259	118 7	224	88 2	189	62 9	154	41 7
258	151	258	117 1	223	87 51	188	62 2	153	41 2
257	150	257	116 2	222	86 7	187	61 5	152	40 6
256	149	256	115 3	221	85 9	186	60 3	151	40 1
255	148 9	255	114 4	22	85 1	185	60 2	15	39 6
254	146 9	254	113 5	219	84 3	184	59 5	149	39
253	145 9	253	112 6	218	83 6	183	59	148	38 5
252	144 9	252	111 9	217	82 84	182	58 3	147	38
251	143 9	251	110 1	216	82 1	181	57 7	146	37 5
250	142 9	250	109 1	215	81 3	18	57	145	37
249	141 9	249	108 1	214	80 6	179	56 4	144	36 5
248	140 9	248	107 2	213	79 8	178	55 7	143	36
247	139 9	247	107 3	212	79	177	55 2	142	35 5
246	138 9	246	106 4	211	78 3	176	54 5	141	35
245	137 9	245	105 6	21	77 6	175	53 8	14	34 5
244	136 9	244	104 7	209	76 9	174	53 3	139	34
243	135 9	243	103 9	208	76 2	173	52 7	138	33 5
242	135	242	103	207	75 4	172	52	137	33
241	134 1	241	102	206	74 7	171	51 5	136	32 5
240	133	240	101 1	205	73 9	17	50 9	135	32
239	132 1	239	100 51	204	73 2	169	50 2	134	31 9
238	131 1	238	99 71	203	72 5	168	49 6	133	31 1
237	130 1	237	98 8	202	71 8	167	49	132	30 7
236	129 1	236	98	201	71	166	48 5	131	30 2
235	128 2	235	97	2	70 4	165	47 9	13	29 7
234	127 3	234	96 3	199	69 7	164	47 3	129	29 3
233	126 3	233	95 5	198	69	163	46 7	128	28 8
232	125 4	232	94 7	197	68 3	162	46 2	127	28 4
231	124 4	231	93 9	196	67 6	161	45 6	126	28

DORMAN, LONG & CO. LIMITED.

TABLE OF TENSILE STRAIN OF WIRE.

From .125 to .001 Inch for 1 Ton per Square Inch for (500)
One Thousandth Part of an Inch

TENSILE OF WIRE IN LBS. FOR 1 TON (2,240 LBS.) PER EACH $\frac{1}{1000}$ INCH.

Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.	Decl.	Lbs.
125	27.5	1	17.6	.075	9.9	.05	4.4	.025	1.1
124	27	.099	17.24	.074	9.6	.049	4.2	.024	1.014
123	26.6	.098	16.9	.073	9.4	.048	4.0	.023	.93
122	26.2	.097	16.6	.072	9.1	.047	3.8	.022	.85
121	25.8	.096	16.2	.071	8.9	.046	3.7	.021	.775
120	25.3	.095	15.9	.070	8.6	.045	3.55	.020	.7
119	24.9	.094	15.55	.069	8.4	.044	3.4	.019	.635
118	24.5	.093	15.2	.068	8.1	.043	3.25	.018	.57
117	24.1	.092	14.8	.067	7.9	.042	3.12	.017	.508
116	23.7	.091	14.6	.066	7.7	.041	2.95	.016	.45
115	23.3	.09	14.3	.065	7.4	.04	2.8	.015	.396
114	22.9	.089	13.9	.064	7.2	.039	2.7	.014	.344
113	22.5	.088	13.5	.063	7	.038	2.56	.013	.297
112	22.1	.087	13.3	.062	6.8	.037	2.4	.012	.253
111	21.7	.086	13	.061	6.5	.036	2.3	.011	.212
110	21.3	.085	12.7	.06	6.33	.035	2.16	.01	.176
109	20.9	.084	12.4	.059	6.1	.034	2.04	.009	.1425
108	20.5	.083	12.1	.058	5.9	.033	1.96	.008	.1126
107	20.1	.082	11.8	.057	5.7	.032	1.8	.007	.0962
106	19.7	.081	11.5	.056	5.5	.031	1.7	.006	.0633
105	19.4	.08	11.26	.055	5.3	.03	1.58	.005	.0439
104	19	.079	11	.054	5.1	.029	1.48	.004	.02815
103	18.7	.078	10.7	.053	4.9	.028	1.38	.003	.01583
102	18.3	.077	10.4	.052	4.8	.027	1.3	.002	.007
101	17.9	.076	10.16	.051	4.6	.026	1.182	.001	.00176

NOTE.—To explain the application of the above table, the following illustration will suffice.

Required to know the breaking strain of any wire the section of which is comprised within the limits of .13 and .001 diameter of section of wire. Find the breaking strain by usual test. Let it be supposed .084. If the wire breaks at 620lbs. strain, find in the table, opposite .084, the figures in the column headed "lbs." 12.4. Use these as a divider. $620 \div 12.4 = 50$ tons.



DORMAN, LONG & CO. LIMITED.

TELEGRAMS: "DORMAN, PORT CLARENCE."

CLARENCE STEEL WORKS AND ROLLING MILLS

PORT CLARENCE.

OPEN HEARTH STEEL.

SPECIALITIES:

High-Class Steels in all qualities.

Hard Steel with Carbon up to 1.5 per cent., for Wire Ropes, Springs, Picks, Saws, Tools, Files, etc.

Steel to stand Admiralty, War Office, Board of Trade, Lloyds, and other Special Tests.

Conductivity Steel to stand General Post Office, India Office, and British Railway Tests.

ROLLED SECTIONS.

Billets, Blooms, Slabs, Tin Bars, Flats, Angles and Rails to British Standard and other Special Sections.



DORMAN, LONG & CO. LIMITED.

OPEN HEARTH STEEL

Manufactured and Rolled at Clarence Steelworks.

INGOTS

Description	Size		Weight
	Inches		Cwts
Octagon Fluted	26 $\frac{1}{2}$	24 $\frac{1}{2}$	100 110
"	27	23 $\frac{1}{2}$	100 115
"	24 $\frac{1}{2}$	20 $\frac{7}{8}$	100 110
"	22	18 $\frac{1}{2}$	75 85
"	20	17	55 65
Hexagon	22	20	60 65
Rectangular	24	20	60 65
"	21	17	35 46
"	16 $\frac{1}{2}$	14 $\frac{1}{2}$	28 30
Square	18		35 42
"	17		30 36
"	16		29 32
"	14 $\frac{1}{2}$		25
"	12		17
Slab	33	11 $\frac{1}{2}$	40 60

All Measurements taken across the Flats.

DORMAN, LONG & CO. LIMITED.

OPEN HEARTH STEEL

Manufactured and Rolled at Clarence Steelworks.

BLOOMS

Inches	Inches	Inches	Inches
10 8	8 7	7 6	6 5
8 8½	7 7	6 6	

BILLETS

Inches	Inches	Inches	Inches
5½ 5½	4 4	3 3	2¼ 2¼
5 5	3½ 3½	2¾ 2¾	2 2
4½ 4½	3¼ 3¼	2½ 2½	1½ 1½

SLABS

Inches	Inches	Inches	Inches
7 4¾	7 2½	7 1½	6 3½
7 3½	7 2	6 4¾	6 3
			6 2

FLATS

Inches	Inches	Inches	Inches	Inches	Inches	Inches
7 1¾	7 ¾	6 2	6 1½	6 1	5 2	4 2
7 1¼	7 ¾	6 1¾	6 1¾	6 ¾	5 1¾	4 1¾
7 1¼	7 ¾	6 1¾	6 1¼	6 ¾	5 1½	4 1½
7 1		6 1¾	6 1½	6 ¾	5 1¼	4 1¼

TINPLATE BARS, TAPER EDGES

Inches	Inches	Inches	Inches
7½ 1	7½ 1½	7½ ¾	7½ ¾
7½ 1½	7½ ¾	7½ ¾	7½ ¾
7½ ¾	7½ ¾	7½ ½	

DORMAN, LONG & CO. LIMITED.

GENERAL INFORMATION,
FORMULÆ, TABLES, ETC.

GENERAL FORMULAE FOR THE FLEXURE OF BEAMS.

- A = area of section in square inches
 l = length of span in feet
 l = length of beam in inches
 W = total distributed load in tons
 w = lbs. stress in tons per square inch in extreme fibres of beam
 d = depth of beam in inches
 y = distance in inches of outermost fibre from neutral axis (in a symmetrical section $y = \frac{d}{2}$)
 M = maximum bending moment in inch tons
 δ = maximum deflection in inches
 I = greatest moment of inertia about the neutral axis (passing through the centre of gravity of section)
 I_x = moment of inertia about an axis parallel to above, but not passing through the centre of gravity
 x = distance in inches between these axes
 Z = section modulus
 r = radius of gyration in inches
 E = modulus of elasticity (assumed at 22,000 tons per square inch for steel)

$$Z = \frac{I}{y} \qquad I_p = I + Ax^2 \qquad r = \sqrt{\frac{I}{A}}$$

$$M = \frac{f I}{y} = f Z \qquad f = \frac{M y}{I} = \frac{M}{Z}$$

For a beam supported at both ends and uniformly loaded, $W = \frac{B \times l}{l} \times Z = \frac{8 \times f \times I}{l \times A}$

- (I) $D = \frac{5 W l^3}{384 E I}$ for beams of uniform section, supported at both ends and uniformly loaded
 (II) $D = \frac{P l^3}{48 E I}$ for beams of uniform section supported at both ends and loaded with a single load, P , at centre of span
 (III) $D = \frac{W l^3}{48 E I}$ for beams of uniform section fixed at one end and supported at the other, and uniformly loaded
 (IV) $D = \frac{P l^3}{3 E I}$ for beams of uniform section fixed at one end and unsupported at the other, and loaded with a single load, P , at the latter end

For girders with equal flanges and f taken at 7½ tons per square inch, the deflection is as follows:

$$(i) D = \frac{.01875 L^2}{d} ; (ii) D = \frac{.015 L^2}{d} ; (iii) D = \frac{.045 L^2}{d} ; (iv) D = \frac{.06 L^2}{d}$$

DORMAN, LONG & CO. LIMITED.

BENDING MOMENT, SHEAR AND DEFLECTION OF BEAMS UNDER VARIOUS SYSTEMS OF LOADING.

W = total load in tons.
 I = moment of inertia.
 E = modulus of elasticity, assumed at 12,000 tons per square inch for steel.
 d = depth of beam in inches.
 l = length of beam in inches.
 a = distance of load from left support in inches.
 b = distance of load from right support in inches.
 A = area of beam in square inches.
 H = mean thickness of web in inches.
 t = mean thickness of flange in inches.

(1) BEAM SUPPORTED AT BOTH ENDS AND HAVING AN UNIFORMLY DISTRIBUTED LOAD



Safe load—that given in the tables.

Maximum bending moment, in inch tons, at middle of span = $Wl = 5 W l$

Maximum shear at points of support = $\frac{W}{2}$

Maximum deflection in inches = $\frac{5 W l^3}{84 E I}$

Maximum deflection in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch = $0.075 l^3$

(2) BEAM SUPPORTED AT BOTH ENDS AND HAVING A CONCENTRATED LOAD IN THE MIDDLE



Safe load—half that given in the tables for case (1).

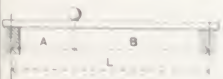
Maximum bending moment, in inch tons, at middle of span = $Wl = 5 W l$

Maximum shear between load and point of support = $\frac{W}{2}$

Maximum deflection in inches = $\frac{W l^3}{84 E I}$

Maximum deflection in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch = $0.075 l^3$

(3) BEAM SUPPORTED AT BOTH ENDS AND HAVING A CONCENTRATED LOAD AT ANY POINT.



Safe load—that given in the tables for case (1) = $\frac{l^2}{8 A B}$

Maximum bending moment, in inch tons, at point of application of load = $W a b = \frac{12 W A B}{l}$

Maximum shear between load and the nearer support = $\frac{W b}{l}$ and between load and the other support = $\frac{W a}{l}$

Maximum deflection = $\frac{W A b (l^2 - b^2)}{8 E I} \sqrt{\frac{1}{12} (2 - \frac{b}{a})}$

Maximum deflection, in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch = $\frac{l^3}{100} \sqrt{\frac{1}{48 A (1 - \frac{A}{l})}}$

NOTE—Care should be taken that the maximum shear, in the above cases, does not exceed half the maximum load given in the tables.

DORMAN, LONG & CO. LIMITED.

BENDING MOMENT, SHEAR AND DEFLECTION OF BEAMS UNDER VARIOUS SYSTEMS OF LOADING.

W = weight load in tons.	L = span in feet.
I = moment of inertia.	l = span in inches.
E = modulus of elasticity, assumed at 12,000 tons per square inch for steel.	A = distance in feet.
d = depth of beam in inches.	a = same distance in inches.
	B = distance in feet.
	b = same distance in inches.

(4) BEAM SUPPORTED AT BOTH ENDS AND HAVING TWO EQUAL LOADS, $\frac{W}{2}$, CONCENTRATED AT EQUAL DISTANCES FROM CENTRE OF BEAM.



Safe load = that given in the tables for case (1). $\frac{L}{4A}$

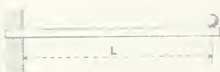
Maximum bending moment, in inch tons, between loads $\frac{W.a}{2} = 6 W.A$

Maximum shear between load and nearer support $\frac{W}{2}$

Maximum deflection, in inches $\frac{1}{48} \frac{W.a}{E.I} (3L^2 - 4A^2)$

Maximum deflection, in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch $= \frac{.0075}{d} (3L^2 - 4A^2)$

(5) BEAM FIXED AT ONE END AND HAVING A CONCENTRATED LOAD AT THE FREE END.



Safe load = $\frac{1}{4}$ that given in the tables for case (1).

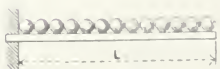
Maximum bending moment, in inch tons, at point of support $W.l = 12 W.L$

Maximum shear between load and point of support W

Maximum deflection, in inches $= \frac{W.l}{3 E.I}$

Maximum deflection, in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch $= \frac{.06 l^2}{d}$

(6) BEAM FIXED AT ONE END AND HAVING AN UNIFORMLY DISTRIBUTED LOAD.



Safe load = $\frac{1}{4}$ that given in the tables for case (1).

Maximum bending moment, in inch tons, at point of support $\frac{W.l}{2} = 6 W.L$

Maximum shear at point of support W

Maximum deflection, in inches $= \frac{W.l}{8 E.I}$

Maximum deflection, in inches, where flanges are equal and extreme fibre stress taken at $7\frac{1}{2}$ tons per square inch $= \frac{.045 L^2}{d}$

NOTE.—Care should be taken that the maximum shear, in the above cases, does not exceed half the maximum load given in the tables.

REPORT: 1954-6-11-11

BENDING MOMENT SHEAR DEFLECTION 4. OF BEAMS UNDER VARIOUS SYSTEMS OF LOADING

1. Bending moment diagram for a beam of length l under a uniformly distributed load q acting downwards. The maximum bending moment is $M_{max} = \frac{ql^2}{8}$ at the center of the beam.
2. Shear force diagram for a beam of length l under a uniformly distributed load q acting downwards. The shear force is zero at the center of the beam and reaches its maximum value $V_{max} = \frac{ql}{2}$ at the supports.
3. Deflection curve for a beam of length l under a uniformly distributed load q acting downwards. The maximum deflection is $\delta_{max} = \frac{ql^4}{8EI}$ at the center of the beam.
4. Bending moment diagram for a beam of length l under a point load P acting downwards at the center. The maximum bending moment is $M_{max} = \frac{Pl}{4}$ at the center of the beam.

5. Shear force diagram for a beam of length l under a point load P acting downwards at the center. The shear force is zero at the center of the beam and reaches its maximum value $V_{max} = \frac{P}{2}$ at the supports.



Diagram of a beam of length l under a uniformly distributed load q acting downwards.

6. Deflection curve for a beam of length l under a point load P acting downwards at the center. The maximum deflection is $\delta_{max} = \frac{Pl^3}{48EI}$ at the center of the beam.

7. Bending moment diagram for a beam of length l under a point load P acting downwards at the center. The maximum bending moment is $M_{max} = \frac{Pl}{4}$ at the center of the beam.

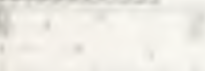


Diagram of a beam of length l under a point load P acting downwards at the center.

8. Shear force diagram for a beam of length l under a point load P acting downwards at the center. The shear force is zero at the center of the beam and reaches its maximum value $V_{max} = \frac{P}{2}$ at the supports.

9. Deflection curve for a beam of length l under a point load P acting downwards at the center. The maximum deflection is $\delta_{max} = \frac{Pl^3}{48EI}$ at the center of the beam.

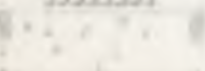
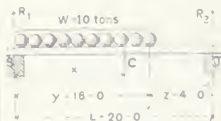


Diagram of a beam of length l under a point load P acting downwards at the center.

DORMAN, LONG & CO. LIMITED.

BEAMS UNSYMMETRICALLY LOADED.



Example showing how to find the size of a beam necessary to carry a load uniformly distributed over a portion of its length, and extending from one support, as shewn in diagram; the beam being supported at both ends and of uniform section throughout.

Assume that W is 10 tons, span 20' 0" and distance that load extends from one support is 16' 0".

Let R_1 = reaction at end, S , where load commences.

R_2 = reaction at other end, T .

C = point where maximum bending moment occurs.

x = distance in feet of C from end S .

P = distributed load on length x .

W_1 = equivalent distributed load, over the whole beam, which would produce the same maximum bending moment as that caused by load W .

$$\text{Then } R_1 = \frac{W \left(\frac{x}{2} + z \right)}{L} = \frac{10 (8 + 4)}{20} = 6 \text{ tons.}$$

$$R_2 = 10 - 6 = 4 \text{ tons.}$$

From formula on previous page $x = \left(1 - \frac{x}{2L} \right) = 16 \left(1 - \frac{16}{2 \times 20} \right) = 9.6$ feet.

$$P = \frac{W \cdot x}{y} = \frac{9.6 \times 10}{16} = 6 \text{ tons.}$$

The maximum bending moment $= (R_1 \times x) - \left(P \times \frac{x}{2} \right) = 6 \times 9.6 - 6 \times 4.8 = 28.8$ ft. tons.

The maximum bending moment in ft. tons on a beam supported at both ends and having an uniformly distributed load, W_1 , is $\frac{W_1 \cdot L^2}{8}$.

Therefore the equivalent distributed load W_E is $\frac{\text{Maximum bending moment in ft. tons} \times 8}{L}$.

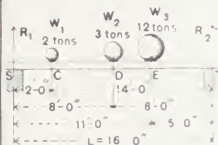
$$\text{Hence } W_E \text{ in this case } = \frac{28.8 \times 8}{20} = 11.52 \text{ tons.}$$

Reference to the table of safe distributed loads on beams will shew that B.S.B 21 (12" \times 6" \times 44 lbs.) is capable of carrying 13 tons at 20 feet span; and, as half the maximum load given in the table for this beam $\left(\frac{40}{2} = 20 \text{ tons} \right)$ is greater than the maximum reaction R_1 (6 tons), this beam will meet the requirements.

DORMAN, LONG & CO. LIMITED.

BEAMS UNSYMMETRICALLY LOADED.

Example shewing how to find the size of a beam necessary to carry three loads concentrated at different points in its length as shown in diagram, the beam being supported at both ends, and of uniform cross section throughout



Let W_1 , W_2 and W_3 be 3 concentrated loads of 2, 3 and 12 tons respectively.

R_1 = reaction at end S.

R_2 = reaction at end T.

W_E = equivalent distributed load over the whole beam which would produce the same maximum bending moment as that caused by W_1 , W_2 , W_3 .

$$\text{Then } R_1 = \frac{(12 \times 5) + (3 \times 8) + (2 \times 14)}{16} = 7 \text{ tons.}$$

$$R_2 = 12 + 3 + 2 - 7 = 10 \text{ tons.}$$

The maximum bending moment occurs at the point of application of any of the loads, and may be found as follows:—

$$\text{The bending moment at C} = R_1 \times 2 = 7 \times 2 = 14 \text{ ft. tons.}$$

$$\text{D} = R_1 \times 8 - 2 \times 6 = 56 - 12 = 44 \text{ „}$$

$$\text{E} = R_1 \times 14 - 2 \times 12 - 3 \times 5 = 98 - 24 - 15 = 59 \text{ „}$$

Hence the maximum bending moment is at E, and = 59 ft. tons.

The maximum bending moment, in ft. tons, on a beam supported at both ends and having an uniformly distributed load W is $\frac{WL}{8}$.

Therefore the equivalent distributed load W_E is $\frac{\text{Maximum bending moment in ft. tons} \times 8}{L}$.

$$\text{Hence } W_E \text{ in this case} = \frac{59 \times 8}{16} = 29 \text{ tons.}$$

Reference to the table of safe distributed loads on beams will shew that B.S.B 26 (15" x 6" x 59 lbs.) is capable of carrying 26 tons at 16 feet span; and, as half the maximum load given in the table for this beam ($\frac{62}{2} = 31$ tons) is greater than the maximum reaction R_2 (10 tons), this beam will meet the requirements.

MENSURATION.**LENGTH.**Circumference of Circle = diameter $\times \pi$ Diameter of Circle = circumference $\div 3.1831$ Length of Arc = number of degrees \times radius $\times .017453$ Degrees in an Arc whose length = radius = 57.2957795

$$\pi = 3.14159265 -$$



V = versed sine

C = half the chord.

R = radius

O = any ordinate.

X = distance of ordinate from centre.

$$O = \sqrt{R^2 - X^2} = (R - V).$$

$$R = \frac{V^2 + C^2}{2V} \text{ or diameter} = \frac{V^2 + C^2}{V}$$

$$V = R - \sqrt{R^2 - C^2}$$

$$X = \sqrt{R^2 - (O + R - V)^2}$$

AREA.Area of Triangle = base \times half the perpendicular height.

$$\therefore \text{Circle} = \frac{\pi D^2}{4} = \pi R^2 \text{ where } D = \text{diameter of circle.}$$

$$R = \text{radius of circle.}$$

Area of Sector

$$\text{of Circle} = \text{Area ABED} = \text{length of arc} \times \text{half the radius}$$

$$= \frac{\text{number of degrees in arc} \times \text{area of circle}}{360}$$

Area of Segment of Circle = Area BDE = area of Sector less area of triangle.

Area of Parabola = base $\times \frac{2}{3}$ height.

DORMAN, LONG & CO. LIMITED.

TRIGONOMETRICAL FUNCTIONS.

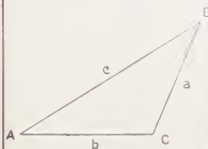
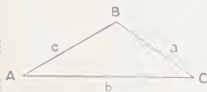


This diagram shows the different trigonometrical functions in terms of the angle A to the radius of 1.

$$\begin{aligned} \text{Sine} &= \frac{\text{Perp.}}{\text{Hyp.}} & \text{Cosine} &= \frac{\text{Base}}{\text{Hyp.}} & \text{Tangent of } A &= \frac{\text{Perp.}}{\text{Base}} \\ \text{Cotangent} &= \frac{\text{Base}}{\text{Perp.}} & \text{Secant of } A &= \frac{\text{Hyp.}}{\text{Base}} \\ \text{Cosecant} &= \frac{\text{Hyp.}}{\text{Perp.}} & \text{Versed sine} &= \frac{\text{Hyp.} - \text{Base}}{\text{Hyp.}} \\ \text{Coversed sine} &= \frac{\text{Hyp.} - \text{Perp.}}{\text{Hyp.}} \end{aligned}$$

$$\begin{aligned} \text{Sin} &= \frac{\text{tan}}{\sec} & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Cos} &= \frac{\cot}{\csc} & \frac{1}{\sin} &= \csc & \frac{1}{\cos} &= \sec \\ \text{Tan} &= \frac{\sin}{\cos} & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Cot} &= \frac{1}{\tan} & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Sec} &= \frac{1}{\cos} & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Cosec} &= \frac{1}{\sin} & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Versin} &= 1 - \cos & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \\ \text{Coversin} &= 1 - \sin & \frac{1}{\cos} &= \sec & \frac{1}{\sin} &= \csc \end{aligned}$$

SOLUTION OF TRIANGLES.



$$\begin{aligned} a^2 &= b^2 + c^2 - 2bc \cos A & a &= b \cos C + c \cos B \\ \frac{a}{\sin A} &= \frac{b}{\sin B} = \frac{c}{\sin C} & \frac{abc}{2s} &= \Delta \\ \cos A &= \frac{b^2 + c^2 - a^2}{2bc} & \text{or } a^2 &= b^2 + c^2 - 2bc \cos A \\ \sin \frac{A}{2} &= \sqrt{\frac{(s-b)(s-c)}{bc}} & \cos \frac{A}{2} &= \sqrt{\frac{s(s-a)}{bc}} \\ \tan \frac{A}{2} &= \sqrt{\frac{(s-b)(s-c)}{s(s-a)}} \\ \sin A &= \frac{2}{bc} \sqrt{s(s-a)(s-b)(s-c)} & \frac{2S}{bc} &= \sin A \text{ where } S = \frac{1}{2} \sqrt{s(s-a)(s-b)(s-c)} \\ \tan \frac{B+C}{2} &= \frac{b+c}{b-c} \tan \frac{B-C}{2} & \frac{b+c}{b-c} &= \cot \frac{A}{2} \\ \tan \frac{B-C}{2} &= \frac{b-c}{b+c} \tan \frac{A}{2} \\ \text{Area of triangle} &= \frac{a \cdot b \cdot \sin C}{2} = \frac{b \cdot c \cdot \sin A}{2} = \frac{a \cdot c \cdot \sin B}{2} \\ &= \frac{1}{2} \sqrt{s(s-a)(s-b)(s-c)} = S \end{aligned}$$

DORMAN, LONG & CO. LIMITED.

MOMENTS OF INERTIA OF RECTANGLES.



Depth in Inches	WIDTH OF RECTANGLE IN INCHES						
	1/4	1/2	3/4	1	1 1/2	2	3
1	0.21	0.26	0.31	0.36	0.42	0.47	0.52
2	17	21	25	29	33	39	42
3	56	70	84	99	113	127	141
4	1.33	1.67	2.01	2.33	2.67	3.01	3.33
5	2.60	3.26	3.91	4.56	5.21	5.86	6.51
6	4.50	5.63	6.75	7.88	8.99	10.13	11.25
7	7.15	8.85	10.72	12.51	14.29	16.08	17.86
8	10.67	13.33	16.00	18.67	21.33	24.00	26.67
9	15.19	18.86	22.75	26.56	30.38	34.17	37.97
10	20.63	26.04	31.25	36.46	41.67	46.87	52.00
11	27.03	34.66	41.59	48.53	54.46	60.39	66.32
12	34.50	43.50	52.50	61.50	70.50	79.50	88.50
13	43.07	53.61	64.25	74.99	85.72	96.46	107.19
14	52.73	64.46	76.19	87.92	99.65	111.38	123.11
15	63.48	76.41	89.34	102.27	115.20	128.13	141.06
16	75.23	89.36	103.49	117.62	131.57	145.54	159.91
17	87.98	103.61	118.92	134.07	151.00	166.43	181.86
18	101.73	118.86	134.41	150.56	170.43	187.36	203.81
19	116.48	134.11	150.90	167.05	190.86	208.29	225.74
20	132.23	150.36	167.39	183.57	211.29	229.22	247.67
21	148.98	166.61	183.88	200.08	231.72	250.15	269.60
22	166.73	182.86	200.37	216.59	252.15	271.08	291.53
23	185.48	200.11	216.86	233.10	272.58	292.01	313.46
24	205.23	217.36	233.35	249.61	293.01	312.94	335.39
25	225.98	234.61	249.84	266.12	313.44	333.87	357.32
26	247.73	251.86	266.33	282.63	333.87	354.80	379.25
27	270.48	269.11	282.82	299.14	354.30	375.73	401.18
28	294.23	286.36	299.31	315.65	374.73	396.66	423.11
29	318.98	303.61	315.80	332.16	395.16	417.59	445.04
30	344.73	320.86	332.29	348.67	415.59	438.52	466.97
31	371.48	338.11	348.78	365.18	436.02	459.45	488.90
32	399.23	355.36	365.27	381.69	456.45	480.38	510.83
33	427.98	372.61	381.76	398.20	476.88	501.31	532.76
34	457.73	389.86	398.25	414.71	497.31	522.24	554.69
35	488.48	407.11	414.74	431.22	517.74	543.17	576.62
36	519.23	424.36	431.23	447.73	538.17	564.10	598.55
37	550.98	441.61	447.72	464.24	558.60	585.03	620.48
38	583.73	458.86	464.21	480.75	579.03	605.96	642.41
39	617.48	476.11	480.70	497.26	599.46	626.89	664.34
40	652.23	493.36	497.19	513.77	619.89	647.82	686.27
41	687.98	510.61	513.68	530.28	640.32	668.75	708.20
42	724.73	527.86	530.17	546.79	660.75	689.68	730.13
43	762.48	545.11	546.66	563.30	681.18	710.61	752.06
44	801.23	562.36	563.15	579.81	701.61	731.54	773.99
45	840.98	579.61	579.64	596.32	722.04	752.47	795.92
46	881.73	596.86	596.13	612.83	742.47	773.40	817.85
47	923.48	614.11	612.62	629.34	762.90	794.33	839.78
48	966.23	631.36	629.11	645.85	783.33	815.26	861.71
49	1010.98	648.61	645.60	662.36	803.76	836.19	883.64
50	1057.73	665.86	662.09	678.87	824.19	857.12	905.57
51	1105.48	683.11	678.58	695.38	844.62	878.05	927.50
52	1154.23	699.86	695.07	711.89	865.05	898.98	949.43
53	1204.98	716.61	711.56	728.40	885.48	919.91	971.36
54	1256.73	733.36	728.05	744.91	905.91	940.84	993.29
55	1309.48	750.61	744.54	761.42	926.34	961.77	1015.22
56	1363.23	767.86	761.03	777.93	946.77	982.70	1037.15
57	1417.98	785.11	777.52	794.44	967.20	1003.63	1059.08
58	1473.73	802.36	794.01	810.95	987.63	1024.56	1081.01
59	1530.48	819.61	810.50	827.46	1008.06	1045.49	1102.94
60	1588.23	836.86	827.00	843.97	1028.49	1066.42	1124.87

DORMAN, LONG & CO. LIMITED.

MOMENTS OF INERTIA OF RECTANGLES.



WIDTH OF RECTANGLE IN INCHES

Depth
in
Inches

1	2	3	4	5	6	Depth in Inches
0.01	0.0001	0.0009	0.0036	0.0081	0.0144	1
0.02	0.0004	0.0036	0.0144	0.0324	0.0576	2
0.03	0.0009	0.0081	0.0324	0.0729	0.1296	3
0.04	0.0016	0.0144	0.0576	0.1296	0.2304	4
0.05	0.0025	0.0225	0.0900	0.2025	0.3600	5
0.06	0.0036	0.0324	0.1296	0.2916	0.5184	6
0.07	0.0049	0.0441	0.1764	0.3969	0.6996	7
0.08	0.0064	0.0576	0.2304	0.5184	0.8944	8
0.09	0.0081	0.0729	0.2916	0.6561	1.1044	9
0.10	0.0100	0.0900	0.3600	0.8100	1.3300	10
0.12	0.0144	0.1296	0.5184	1.1044	1.7712	12
0.14	0.0196	0.1764	0.6996	1.4400	2.3316	14
0.16	0.0256	0.2304	0.8944	1.8144	3.0144	16
0.18	0.0324	0.2916	1.1044	2.2376	3.8184	18
0.20	0.0400	0.3600	1.3300	2.7000	4.7400	20
0.22	0.0484	0.4410	1.5724	3.2044	5.7784	22
0.24	0.0576	0.5280	1.8360	3.7536	6.9336	24
0.26	0.0676	0.6216	2.1200	4.3464	8.2044	26
0.28	0.0784	0.7216	2.4244	4.9836	9.5904	28
0.30	0.0900	0.8280	2.7480	5.6640	11.0880	30
0.32	0.1024	0.9408	3.0900	6.3872	12.6976	32
0.34	0.1156	1.0596	3.4500	7.1532	14.4180	34
0.36	0.1296	1.1844	3.8280	7.9616	16.2480	36
0.38	0.1444	1.3156	4.2240	8.8124	18.1876	38
0.40	0.1600	1.4536	4.6380	9.7160	20.2360	40
0.42	0.1764	1.5984	5.0696	10.6724	22.3936	42
0.44	0.1936	1.7500	5.5184	11.6816	24.6600	44
0.46	0.2116	1.9084	5.9840	12.7436	27.0356	46
0.48	0.2304	2.0736	6.4664	13.8584	29.5200	48
0.50	0.2500	2.2460	6.9656	15.0256	32.1120	50
0.52	0.2704	2.4256	7.4816	16.2456	34.8120	52
0.54	0.2916	2.6124	8.0144	17.5184	37.6196	54
0.56	0.3136	2.8064	8.5640	18.8432	40.5344	56
0.58	0.3364	3.0076	9.1304	20.2196	43.5564	58
0.60	0.3600	3.2160	9.7136	21.6472	46.6840	60
0.62	0.3844	3.4316	10.3136	23.1256	49.9164	62
0.64	0.4096	3.6544	10.9304	24.6544	53.2520	64
0.66	0.4356	3.8844	11.5636	26.2336	56.6904	66
0.68	0.4624	4.1216	12.2136	27.8632	60.2312	68
0.70	0.4900	4.3660	12.8800	29.5432	63.8740	70
0.72	0.5184	4.6176	13.5624	31.2736	67.6184	72
0.74	0.5476	4.8764	14.2608	33.0544	71.4640	74
0.76	0.5776	5.1424	14.9752	34.8856	75.4104	76
0.78	0.6084	5.4156	15.7056	36.7672	79.4576	78
0.80	0.6400	5.6960	16.4512	38.6992	83.6040	80
0.82	0.6724	5.9836	17.2120	40.6808	87.8496	82
0.84	0.7056	6.2784	17.9880	42.7120	92.1936	84
0.86	0.7396	6.5804	18.7888	44.7928	96.6356	86
0.88	0.7744	6.8896	19.6136	46.9232	101.1756	88
0.90	0.8100	7.2060	20.4624	49.1032	105.8120	90
0.92	0.8464	7.5296	21.3344	51.3328	110.5440	92
0.94	0.8836	7.8596	22.2288	53.6120	115.3716	94
0.96	0.9216	8.1960	23.1448	55.9408	120.2944	96
0.98	0.9604	8.5388	24.0824	58.3184	125.3116	98
1.00	1.0000	8.8880	25.0416	60.7440	130.4236	100

MOMENTS OF INERTIA OF RECTANGLES.

Neutral

Axis

		Widths in Inches, corresponding to those of Flats, see page 30.									
Depths in Inches		8	9	10	12	13	14	16	18	20	24
1/2	1/2	005	004	044	063	067	062	070	079	088	105
		056	063	070	084	091	096	112	126	140	167
		083	094	104	125	135	146	167	187	208	250
1/2	1/2	119	133	148	172	193	208	237	267	297	350
		163	183	203	244	264	285	326	366	407	488
		217	244	271	325	352	373	433	497	542	650
1/2	1/2	281	316	342	422	457	492	562	633	703	844
		368	400	447	536	581	626	715	805	894	1073
		447	502	558	670	726	782	893	1005	1117	1340
1/2	1	541	618	687	824	893	961	1099	1236	1373	1648
		667	750	833	1000	1083	1167	1333	1500	1667	2000
		1000	1000	1000	1199	1299	1399	1599	1799	1999	2399
1 1/2	1 1/2	149	168	187	1424	1542	1661	1898	2136	2373	2848
		1116	1286	1385	1676	1814	1954	2233	2512	2791	3349
		1302	1465	1638	1963	2116	2279	2604	2930	3255	3906
1 1/2	1 1/2	1507	1696	1834	2261	2449	2638	3015	3391	3768	4522
		1733	1950	2166	2600	2816	3033	3466	3899	4333	5199
		1980	2228	2475	2970	3218	3466	3961	4456	4951	5941
1 1/2	1 1/2	2250	2531	2812	3375	3656	3937	4500	5062	5625	6750
		2543	2861	3170	3815	4133	4450	5086	5722	6358	7629
		2861	3210	3576	4291	4649	5006	5721	6437	7152	8582
1 1/2	1 1/2	3204	3604	4005	4805	5206	5606	6407	7208	8009	9611
		3573	4020	4466	5359	5806	6253	7146	8039	8932	10719
		3970	4466	4962	5954	6451	6947	7939	8932	9924	11909
1 1/2	1 1/2	4395	4944	5493	6592	7141	7690	8689	9682	10986	13184
		4840	5455	6061	7273	7879	8485	9498	10510	12122	14546
		5333	6000	6667	8000	8667	9333	10667	12000	13333	16000
2 1/2	2 1/2	5949	6780	7311	8774	9505	10236	11698	13161	14623	17544
		6397	7197	7996	9536	10395	11195	12794	14394	15993	19191
		6970	7851	8723	10468	11340	1212	13957	15701	17446	20935
2 1/2	2 1/2	7504	8543	9492	11391	12340	13289	15187	17086	18984	22781
		8244	9275	10305	12366	13397	14428	16439	18550	20611	24733
		9311	10471	11641	13396	14513	15629	17862	20095	22327	26793
2 1/2	2 1/2	10655	10862	12068	14482	15689	16896	19310	21723	24137	28964
		10417	11719	13021	15625	16927	18229	20833	23437	26042	31250
		11218	12620	14022	16826	18229	19631	22435	25240	28044	33653
2 1/2	2 1/2	12059	13566	15073	18088	19595	21103	24117	27132	30146	36176
		12841	14558	16176	19411	21028	22646	25881	29116	32351	38822
		13665	15598	17331	20797	22530	24263	27729	31195	34661	41594
2 1/2	2 1/2	14832	16685	18539	22247	24101	25955	29663	33371	37079	44436
		15842	17823	19803	23764	25744	27724	31685	35646	39606	47527
		16898	19011	21123	25347	27460	29572	33797	38021	42246	50696
2 1/2	3	18000	20250	22500	27000	29250	31500	36000	40500	45000	54000

DORMAN, LONG & CO. LIMITED.

SHEARING AND BEARING VALUES OF RIVETS.

Dia of Rivet in inches	Area in Square inches	Shearing Values at 4 tons per sq inch		BEARING VALUES AT 7 TONS PER SQ INCH									
		Single Shear	Double Shear	Thickness in inches of Plate passed through									
1/2	1104	44	75	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/8	1365	78	137	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1/2	2065	137	241	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
5/8	3415	241	422	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/4	5015	422	741	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
7/8	6915	601	1061	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1	9264	881	1541	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8

Dia of Rivet in inches	Area in Square inches	Shearing Values at 5 tons per sq inch		BEARING VALUES AT 8 TONS PER SQ INCH									
		Single Shear	Double Shear	Thickness in inches of Plate passed through									
1/2	1104	55	94	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/8	1365	94	167	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1/2	2065	167	299	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
5/8	3415	299	538	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/4	5015	538	967	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
7/8	6915	777	1397	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1	9264	1111	2001	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8

Dia of Rivet in inches	Area in Square inches	Shearing Values at 6 tons per sq inch		BEARING VALUES AT 10 TONS PER SQ INCH									
		Single Shear	Double Shear	Thickness in inches of Plate passed through									
1/2	1104	66	111	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/8	1365	111	198	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1/2	2065	198	355	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
5/8	3415	355	638	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
3/4	5015	638	1155	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
7/8	6915	888	1601	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8
1	9264	1222	2201	1/16	1/8	1/4	3/16	1/2	5/8	3/4	7/8	1	1 1/8

In the above tables double shear is calculated at 75% thereof, and the bearing values are calculated at 75% thereof, and the bearing values are greater than double shear for the corresponding thicknesses, and in such cases the bearing values are the determining factors.

The bearing values above and to the right of the upper diagonal line in the tables are greater than double shear for the corresponding thicknesses, and in such cases the bearing values are the determining factors.

The bearing values between the lower and upper diagonals are greater than single and less than double shear for the corresponding thicknesses, and in such cases of single shear the bearing value is the determining factor, and in such cases of double shear the bearing value is the determining factor.

The bearing values below and to the left of the lower diagonal line are less than single shear, and in such cases the bearing values are the determining factors.

DORMAN, LONG & CO. LIMITED.

WEIGHTS OF ANGLES IN LBS. PER
LINEAL FOOT.

SIZE OF FLANGES IN INCHES										Thickness of Angle in Inches
7	8	9	10	11	12	13	14	15	16	
										1/4
6.17										1/2
9.73	10.87	11.00	11.64	12.97						3/4
11.25	12.90	12.74	13.49	14.95	16.97	18.70	17.91			1
12.75	13.91	14.45	15.31	16.45	17.09	17.84	19.35	20.35		1 1/4
14.22	15.49	16.14	17.19	18.45	19.61	19.95	21.69	22.84		1 1/2
15.67	16.74	17.00	18.27	19.92	20.85	20.04	22.19	23.67		1 3/4
17.09	18.27	18.94	20.61	21.77	20.34	21.10	23.45	25.19		2
18.45	19.77	21.01	22.89	24.52	25.89	25.15	27.29	29.09		2 1/4
		22.12	24.07	25.10	26.95	26.11	28.51	30.00		2 1/2
				26.60	28.50	28.99	31.41	33.00		3

AREAS OF ANGLES IN SQUARE INCHES.

SIZE OF FLANGES IN INCHES										Thickness of Angle in Inches
7	8	9	10	11	12	13	14	15	16	
										1/4
0.2462	402									1/2
2.6712	869	0504	2208	4240	610					3/4
3.0863	3033	5613	7422	9074	1044	1034	619	0.002		1
3.4993	7484	0034	2624	5024	7000	0805	246	3.755	2.753	1 1/4
3.9024	1284	4684	7485	0285	2695	6905	869	8.437	8.683	1 1/2
4.2984	0094	9255	2865	5465	8005	1726	482	7.112	9.409	1 3/4
4.6835	0275	2755	7176	0616	4036	7467	086	7.780	10.527	2
	3.4375	8166	1896	5046	9367	3137	686	8.4411	437	2 1/4
			7.1117	5497	9659	4228	857	9.737	10.284	2 1/2
					9.0006	0009	90411	00315	003	3

DORMAN, LONG & CO. LIMITED.

WEIGHT OF FLAT ROLLED STEEL IN LBS.
PER LINEAL FOOT.

Width in Inches		THICKNESS IN INCHES							
		$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
1	1	213	425	638	850	1 06	1 28	1 49	1 70
		266	531	797	1 06	1 33	1 59	1 86	2 13
	1 1/4	319	638	956	1 28	1 59	1 91	2 23	2 55
		372	744	1 12	1 49	1 86	2 23	2 60	2 98
2	2	425	850	1 28	1 70	2 13	2 55	2 98	3 40
		478	956	1 43	1 91	2 39	2 87	3 35	3 83
	2 1/4	531	1 06	1 59	2 13	2 66	3 19	3 72	4 25
		584	1 17	1 75	2 34	2 92	3 51	4 09	4 68
3	3	638	1 28	1 91	2 55	3 19	3 83	4 46	5 10
		691	1 38	2 07	2 76	3 45	4 14	4 83	5 53
	3 1/4	744	1 49	2 23	2 98	3 72	4 46	5 21	5 95
		797	1 59	2 39	3 19	3 98	4 78	5 58	6 38
4	4	850	1 70	2 55	3 40	4 25	5 10	5 95	6 80
		903	1 81	2 71	3 61	4 52	5 42	6 32	7 23
	4 1/4	956	1 91	2 87	3 83	4 78	5 74	6 69	7 65
		1 01	2 02	3 03	4 04	5 05	6 06	7 07	8 08
5	5	1 06	2 13	3 19	4 25	5 31	6 38	7 44	8 50
		1 12	2 23	3 35	4 46	5 58	6 69	7 81	8 93
	5 1/4	1 17	2 34	3 51	4 68	5 84	7 01	8 18	9 35
		1 22	2 44	3 67	4 89	6 11	7 33	8 55	9 78
6	6	1 28	2 55	3 83	5 10	6 38	7 65	8 93	10 20
		1 33	2 66	3 98	5 31	6 64	7 97	9 30	10 63
	6 1/4	1 38	2 76	4 14	5 53	6 91	8 29	9 67	11 05
		1 43	2 87	4 30	5 74	7 17	8 61	10 04	11 48
7	7	1 49	2 98	4 46	5 95	7 44	8 93	10 41	11 90
		1 54	3 08	4 62	6 16	7 70	9 24	10 78	12 33
	7 1/4	1 59	3 19	4 78	6 38	7 97	9 56	11 16	12 75
		1 65	3 29	4 94	6 59	8 23	9 88	11 53	13 18
8	8	1 70	3 40	5 10	6 80	8 50	10 20	11 90	13 60
		1 75	3 51	5 26	7 01	8 77	10 52	12 27	14 03
	8 1/4	1 81	3 61	5 42	7 23	9 03	10 84	12 64	14 45
		1 86	3 72	5 58	7 44	9 30	11 16	13 02	14 88
9	9	1 91	3 83	5 74	7 65	9 56	11 48	13 39	15 30
		1 97	3 93	5 90	7 86	9 83	11 80	13 76	15 73
	9 1/4	2 02	4 04	6 06	8 08	10 09	12 11	14 13	16 15
		2 07	4 14	6 22	8 29	10 36	12 43	14 50	16 58
10	10	2 13	4 25	6 38	8 50	10 63	12 75	14 88	17 00
		2 18	4 36	6 53	8 71	10 89	13 07	15 25	17 43
	10 1/4	2 23	4 46	6 70	8 93	11 16	13 39	15 62	17 85
		2 28	4 57	6 85	9 14	11 42	13 71	15 99	18 28
11	11	2 34	4 68	7 01	9 35	11 69	14 03	16 36	18 70
		2 39	4 78	7 17	9 56	11 95	14 34	16 73	19 13
	11 1/4	2 44	4 89	7 33	9 78	12 22	14 66	17 11	19 55
		2 50	5 00	7 49	9 99	12 48	14 98	17 48	19 98
12	12	2 55	5 10	7 65	10 20	12 75	15 30	17 85	20 40

DORMEN LONG & CO LIMITED

WEIGHT OF FLAT ROLLED STEEL IN LBS.
PER LINEAL FOOT.

THICKNESS IN INCHES

Width
in
Inches

16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

1.91	2.13	2.34	2.56	2.78	3.00	3.21	3.43	3.64	3.86	4.07	4.28	4.49	4.70	4.91	5.12	5.33	5.54	5.75	5.96	6.17	6.38	6.59	6.80	7.01	7.22	7.43	7.64	7.85	8.06	8.27	8.48	8.69	8.90	9.11	9.32	9.53	9.74	9.95	10.16	10.37	10.58	10.79	11.00	11.21	11.42	11.63	11.84	12.05	12.26	12.47	12.68	12.89	13.10	13.31	13.52	13.73	13.94	14.15	14.36	14.57	14.78	14.99	15.20	15.41	15.62	15.83	16.04	16.25	16.46	16.67	16.88	17.09	17.30	17.51	17.72	17.93	18.14	18.35	18.56	18.77	18.98	19.19	19.40	19.61	19.82	20.03	20.24	20.45	20.66	20.87	21.08	21.29	21.50	21.71	21.92	22.13	22.34	22.55	22.76	22.97	23.18	23.39	23.60	23.81	24.02	24.23	24.44	24.65	24.86	25.07	25.28	25.49	25.70	25.91	26.12	26.33	26.54	26.75	26.96	27.17	27.38	27.59	27.80	28.01	28.22	28.43	28.64	28.85	29.06	29.27	29.48	29.69	29.90	30.11	30.32	30.53	30.74	30.95	31.16	31.37	31.58	31.79	32.00	32.21	32.42	32.63	32.84	33.05	33.26	33.47	33.68	33.89	34.10	34.31	34.52	34.73	34.94	35.15	35.36	35.57	35.78	35.99	36.20	36.41	36.62	36.83	37.04	37.25	37.46	37.67	37.88	38.09	38.30	38.51	38.72	38.93	39.14	39.35	39.56	39.77	39.98	40.19	40.40	40.61	40.82	41.03	41.24	41.45	41.66	41.87	42.08	42.29	42.50	42.71	42.92	43.13	43.34	43.55	43.76	43.97	44.18	44.39	44.60	44.81	45.02	45.23	45.44	45.65	45.86	46.07	46.28	46.49	46.70	46.91	47.12	47.33	47.54	47.75	47.96	48.17	48.38	48.59	48.80	49.01	49.22	49.43	49.64	49.85	50.06	50.27	50.48	50.69	50.90	51.11	51.32	51.53	51.74	51.95	52.16	52.37	52.58	52.79	53.00	53.21	53.42	53.63	53.84	54.05	54.26	54.47	54.68	54.89	55.10	55.31	55.52	55.73	55.94	56.15	56.36	56.57	56.78	56.99	57.20	57.41	57.62	57.83	58.04	58.25	58.46	58.67	58.88	59.09	59.30	59.51	59.72	59.93	60.14	60.35	60.56	60.77	60.98	61.19	61.40	61.61	61.82	62.03	62.24	62.45	62.66	62.87	63.08	63.29	63.50	63.71	63.92	64.13	64.34	64.55	64.76	64.97	65.18	65.39	65.60	65.81	66.02	66.23	66.44	66.65	66.86	67.07	67.28	67.49	67.70	67.91	68.12	68.33	68.54	68.75	68.96	69.17	69.38	69.59	69.80	70.01	70.22	70.43	70.64	70.85	71.06	71.27	71.48	71.69	71.90	72.11	72.32	72.53	72.74	72.95	73.16	73.37	73.58	73.79	74.00	74.21	74.42	74.63	74.84	75.05	75.26	75.47	75.68	75.89	76.10	76.31	76.52	76.73	76.94	77.15	77.36	77.57	77.78	77.99	78.20	78.41	78.62	78.83	79.04	79.25	79.46	79.67	79.88	80.09	80.30	80.51	80.72	80.93	81.14	81.35	81.56	81.77	81.98	82.19	82.40	82.61	82.82	83.03	83.24	83.45	83.66	83.87	84.08	84.29	84.50	84.71	84.92	85.13	85.34	85.55	85.76	85.97	86.18	86.39	86.60	86.81	87.02	87.23	87.44	87.65	87.86	88.07	88.28	88.49	88.70	88.91	89.12	89.33	89.54	89.75	89.96	90.17	90.38	90.59	90.80	91.01	91.22	91.43	91.64	91.85	92.06	92.27	92.48	92.69	92.90	93.11	93.32	93.53	93.74	93.95	94.16	94.37	94.58	94.79	95.00	95.21	95.42	95.63	95.84	96.05	96.26	96.47	96.68	96.89	97.10	97.31	97.52	97.73	97.94	98.15	98.36	98.57	98.78	98.99	99.20	99.41	99.62	99.83	100.04	100.25	100.46	100.67	100.88	101.09	101.30	101.51	101.72	101.93	102.14	102.35	102.56	102.77	102.98	103.19	103.40	103.61	103.82	104.03	104.24	104.45	104.66	104.87	105.08	105.29	105.50	105.71	105.92	106.13	106.34	106.55	106.76	106.97	107.18	107.39	107.60	107.81	108.02	108.23	108.44	108.65	108.86	109.07	109.28	109.49	109.70	109.91	110.12	110.33	110.54	110.75	110.96	111.17	111.38	111.59	111.80	112.01	112.22	112.43	112.64	112.85	113.06	113.27	113.48	113.69	113.90	114.11	114.32	114.53	114.74	114.95	115.16	115.37	115.58	115.79	116.00	116.21	116.42	116.63	116.84	117.05	117.26	117.47	117.68	117.89	118.10	118.31	118.52	118.73	118.94	119.15	119.36	119.57	119.78	119.99	120.20	120.41	120.62	120.83	121.04	121.25	121.46	121.67	121.88	122.09	122.30	122.51	122.72	122.93	123.14	123.35	123.56	123.77	123.98	124.19	124.40	124.61	124.82	125.03	125.24	125.45	125.66	125.87	126.08	126.29	126.50	126.71	126.92	127.13	127.34	127.55	127.76	127.97	128.18	128.39	128.60	128.81	129.02	129.23	129.44	129.65	129.86	130.07	130.28	130.49	130.70	130.91	131.12	131.33	131.54	131.75	131.96	132.17	132.38	132.59	132.80	133.01	133.22	133.43	133.64	133.85	134.06	134.27	134.48	134.69	134.90	135.11	135.32	135.53	135.74	135.95	136.16	136.37	136.58	136.79	137.00	137.21	137.42	137.63	137.84	138.05	138.26	138.47	138.68	138.89	139.10	139.31	139.52	139.73	139.94	140.15	140.36	140.57	140.78	140.99	141.20	141.41	141.62	141.83	142.04	142.25	142.46	142.67	142.88	143.09	143.30	143.51	143.72	143.93	144.14	144.35	144.56	144.77	144.98	145.19	145.40	145.61	145.82	146.03	146.24	146.45	146.66	146.87	147.08	147.29	147.50	147.71	147.92	148.13	148.34	148.55	148.76	148.97	149.18	149.39	149.60	149.81	150.02	150.23	150.44	150.65	150.86	151.07	151.28	151.49	151.70	151.91	152.12	152.33	152.54	152.75	152.96	153.17	153.38	153.59	153.80	154.01	154.22	154.43	154.64	154.85	155.06	155.27	155.48	155.69	155.90	156.11	156.32	156.53	156.74	156.95	157.16	157.37	157.58	157.79	158.00	158.21	158.42	158.63	158.84	159.05	159.26	159.47	159.68	159.89	160.10	160.31	160.52	160.73	160.94	161.15	161.36	161.57	161.78	161.99	162.20	162.41	162.62	162.83	163.04	163.25	163.46	163.67	163.88	164.09	164.30	164.51	164.72	164.93	165.14	165.35	165.56	165.77	165.98	166.19	166.40	166.61	166.82	167.03	167.24	167.45	167.66	167.87	168.08	168.29	168.50	168.71	168.92	169.13	169.34	169.55	169.76	169.97	170.18	170.39	170.60	170.81	171.02	171.23	171.44	171.65	171.86	172.07	172.28	172.49	172.70	172.91	173.12	173.33	173.54	173.75	173.96	174.17	174.38	174.59	174.80	175.01	175.22	175.43	175.64	175.85	176.06	176.27	176.48	176.69	176.90	177.11	177.32	177.53	177.74	177.95	178.16	178.37	178.58	178.79	179.00	179.21	179.42	179.63	179.84	180.05	180.26	180.47	180.68	180.89	181.10	181.31	181.52	181.73	181.94	182.15	182.36	182.57	182.78	182.99	183.20	183.41	183.62	183.83	184.04	184.25	184.46	184.67	184.88	185.09	185.30	185.51	185.72	185.93	186.14	186.35	186.56	186.77	186.98	187.19	187.40	187.61	187.82	188.03	188.24	188.45	188.66	188.87	189.08	189.29	189.50	189.71	189.92	190.13	190.34	190.55	190.76	190.97	191.18	191.39	191.60	191.81	192.02	192.23	192.44	192.65	192.86	193.07	193.28	193.49	193.70	193.91	194.12	194.33	194.54	194.75	194.96	195.17	195.38	195.59	195.80	196.01	196.22	196.43	196.64	196.85	197.06	197.27	197.48	197.69	197.90	198.11	198.32	198.53	198.74	198.95	199.16	199.37	199.58	199.79	200.00
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

DORMAN, LONG & CO. LIMITED.

WEIGHT OF FLAT ROLLED STEEL IN LBS.
PER LINEAL FOOT.

Width in Inches	THICKNESS IN INCHES							
	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
13	2 76	5 53	8 29	11 05	13 81	16 58	19 34	22 10
14	2 98	5 95	8 93	11 90	14 88	17 85	20 83	23 80
15	3 19	6 38	9 56	12 75	15 94	19 13	22 31	25 50
16	3 40	6 80	10 20	13 60	17 00	20 40	23 80	27 20
17	3 61	7 23	10 84	14 45	18 06	21 68	25 29	28 90
18	3 83	7 65	11 48	15 30	19 13	22 95	26 78	30 60
19	4 04	8 08	12 11	16 15	20 19	24 23	28 28	32 30
20	4 25	8 50	12 75	17 00	21 25	25 50	29 75	34 00
21	4 46	8 93	13 39	17 85	22 31	26 78	31 24	35 70
22	4 68	9 35	14 03	18 70	23 38	28 05	32 72	37 40
23	4 89	9 78	14 66	19 55	24 44	29 33	34 21	39 10
24	5 10	10 20	15 30	20 40	25 50	30 60	35 70	40 80
25	5 31	10 60	15 94	21 25	26 56	31 88	37 19	42 50
26	5 53	11 05	16 58	22 10	27 63	33 15	38 68	44 20
27	5 74	11 48	17 21	22 95	28 69	34 43	40 16	45 90
28	5 95	11 90	17 85	23 80	29 75	35 70	41 65	47 60
29	6 16	12 33	18 49	24 65	30 81	36 98	43 14	49 30
30	6 38	12 75	19 13	25 50	31 88	38 25	44 63	51 00
31	6 59	13 18	19 76	26 35	32 94	39 53	46 11	52 70
32	6 80	13 60	20 40	27 20	34 00	40 80	47 60	54 40
33	7 01	14 03	21 04	28 05	35 06	42 08	49 09	56 10
34	7 23	14 45	21 68	28 90	36 13	43 35	50 58	57 80
35	7 44	14 88	22 31	29 75	37 19	44 63	52 06	59 50
36	7 65	15 30	22 95	30 60	38 25	45 90	53 55	61 20
37	7 86	15 73	23 59	31 45	39 31	47 18	55 04	62 90
38	8 08	16 15	24 23	32 30	40 38	48 45	56 53	64 60
39	8 29	16 58	24 86	33 15	41 44	49 73	58 01	66 30
40	8 50	17 00	25 50	34 00	42 50	51 00	59 50	68 00
41	8 71	17 43	26 14	34 85	43 56	52 28	60 99	69 70
42	8 93	17 85	26 78	35 70	44 63	53 55	62 48	71 40
43	9 14	18 28	27 41	36 55	45 69	54 83	63 96	73 10
44	9 35	18 70	28 05	37 40	46 75	56 10	65 45	74 80
45	9 56	19 13	28 69	38 25	47 81	57 38	66 94	76 50
46	9 78	19 55	29 33	39 10	48 88	58 65	68 43	78 20
47	9 99	19 98	29 96	39 95	49 94	59 93	69 91	79 90
48	10 20	20 40	30 60	40 80	51 00	61 20	71 40	81 60
50	10 63	21 25	31 88	42 50	53 13	63 75	74 38	85 00
52	11 05	22 10	33 15	44 20	55 25	66 30	77 35	88 40
54	11 48	22 95	34 43	45 90	57 38	68 85	80 33	91 80

VALUES FOR ADDITIONAL WIDTHS OF $\frac{1}{4}$ ", $\frac{1}{2}$ " AND $\frac{3}{4}$ "

$\frac{1}{4}$	053	106	159	213	266	319	372	425
$\frac{1}{2}$	106	213	319	425	531	638	744	850
$\frac{3}{4}$	159	319	478	638	797	956	1 116	1 275

DORMAN, LONG & CO. LIMITED.

WEIGHT OF FLAT ROLLED STEEL IN LBS.
PER LINEAL FOOT.

THICKNESS IN INCHES								Width in Inches
$\frac{3}{16}$	$\frac{7}{16}$	$\frac{11}{16}$	$\frac{1}{4}$	$\frac{13}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	1	
24.86	27.63	30.39	33.15	35.91	38.68	41.44	44.20	13
26.78	29.75	32.73	35.70	38.66	41.65	44.63	47.60	14
28.69	31.88	35.06	38.25	41.44	44.63	47.81	51.00	15
30.60	34.00	37.40	40.80	44.20	47.60	51.00	54.40	16
32.51	36.13	39.74	43.35	46.96	50.58	54.19	57.80	17
34.43	38.25	42.08	45.90	49.73	53.55	57.38	61.20	18
36.34	40.38	44.41	48.45	52.49	56.53	60.56	64.60	19
38.25	42.50	46.75	51.00	55.25	59.50	63.75	68.00	20
40.16	44.63	49.09	53.55	58.01	62.48	66.94	71.40	21
42.08	46.75	51.43	56.10	60.78	65.45	70.13	74.80	22
43.99	48.88	53.76	58.65	63.54	68.43	73.31	78.20	23
45.90	51.00	56.10	61.20	66.30	71.40	76.50	81.60	24
47.81	53.13	58.44	63.75	69.06	74.38	79.69	85.00	25
49.73	55.25	60.78	66.30	71.83	77.35	82.88	88.40	26
51.64	57.38	63.11	68.85	74.59	80.33	86.06	91.80	27
53.55	59.50	65.45	71.40	77.35	83.30	89.25	95.20	28
55.46	61.63	67.79	73.95	80.11	86.28	92.44	98.60	29
57.38	63.75	70.13	76.50	82.88	89.25	95.63	102.00	30
59.29	65.88	72.46	79.05	85.64	92.23	98.81	105.40	31
61.20	68.00	74.80	81.60	88.40	95.20	102.00	108.80	32
63.11	70.13	77.14	84.15	91.16	98.18	105.19	112.20	33
65.03	72.25	79.48	86.70	93.93	101.15	108.38	115.60	34
66.94	74.38	81.81	89.25	96.69	104.13	111.56	119.00	35
68.85	76.50	84.15	91.80	99.45	107.10	114.75	122.40	36
70.76	78.63	86.49	94.35	102.21	110.08	117.94	125.80	37
72.68	80.75	88.83	96.90	104.98	113.05	121.13	129.20	38
74.59	82.88	91.16	99.45	107.74	116.03	124.31	132.60	39
76.50	85.00	93.50	102.00	110.50	119.00	127.50	136.00	40
78.41	87.13	95.84	104.55	113.26	121.98	130.69	139.40	41
80.33	89.25	98.18	107.10	116.03	124.95	133.88	142.80	42
82.24	91.38	100.51	109.65	118.79	127.93	137.06	146.20	43
84.15	93.50	102.85	112.20	121.55	130.90	140.25	149.60	44
86.06	95.63	105.19	114.75	124.31	133.88	143.44	153.00	45
87.98	97.75	107.53	117.30	127.08	136.85	146.63	156.40	46
89.89	99.88	109.86	119.85	129.84	139.83	149.81	159.80	47
91.80	102.00	112.20	122.40	132.60	142.80	153.00	163.20	48
95.63	106.25	116.88	127.50	138.13	148.75	159.38	170.00	50
99.45	110.50	121.55	132.60	143.65	154.70	165.75	176.80	52
103.28	114.75	126.23	137.70	149.18	160.65	172.13	183.60	54

VALUES FOR ADDITIONAL WIDTHS OF $\frac{1}{4}$ ", $\frac{1}{2}$ " AND $\frac{3}{4}$ ".

.478	.531	.584	.638	.691	.744	.797	.850	$\frac{1}{4}$
.956	1.063	1.169	1.275	1.381	1.488	1.594	1.700	$\frac{1}{2}$
1.434	1.594	1.753	1.913	2.072	2.231	2.391	2.550	$\frac{3}{4}$

DORMAN, LONG & CO. LIMITED.

WEIGHT OF ROUND AND SQUARE STEEL BARS
IN LBS. PER LINEAL FOOT.

Diameter or Side in inches	Round ●	Square ■	Diameter or Side in inches	Round ●	Square ■	Diameter or Side in inches	Round ●	Square ■
$\frac{1}{8}$	·157	·213	$1\frac{1}{4}$	4·172	5·312	3	24·03	30·60
$\frac{1}{4}$	·251	·332	$1\frac{1}{2}$	5·049	6·426	$3\frac{1}{4}$	28·21	35·91
$\frac{3}{8}$	·376	·478	$1\frac{3}{4}$	6·008	7·650	$3\frac{1}{2}$	32·71	41·65
$\frac{1}{2}$	·511	·651	2	7·051	8·978	$3\frac{3}{4}$	37·55	47·21
$\frac{5}{8}$	·658	·849	$2\frac{1}{4}$	8·178	10·412	4	42·73	54·40
$\frac{3}{4}$	·818	1·076	$2\frac{1}{2}$	9·382	11·953	$4\frac{1}{4}$	48·23	61·41
$\frac{7}{8}$	·991	1·322	2	10·681	13·600	$4\frac{1}{2}$	54·07	68·85
1	1·252	1·607	$2\frac{3}{4}$	12·06	15·35	$4\frac{3}{4}$	60·25	76·71
$1\frac{1}{8}$	1·502	1·912	3	13·52	17·21	5	66·76	85·00
$1\frac{1}{4}$	1·763	2·243	$3\frac{1}{4}$	15·06	19·18	$5\frac{1}{4}$	73·60	93·71
$1\frac{1}{2}$	2·044	2·603	$3\frac{1}{2}$	16·69	21·25	$5\frac{1}{2}$	80·78	102·85
$1\frac{3}{4}$	2·347	2·992	4	18·40	23·43	$5\frac{3}{4}$	88·29	112·41
2	2·670	3·400	$4\frac{1}{4}$	20·19	25·71	6	96·13	122·40
$2\frac{1}{8}$	3·030	4·003	$4\frac{1}{2}$	22·07	28·10			

WHITWORTH'S STANDARD SIZES OF BOLTS
AND NUTS.

Diameter of Bolt in inches		No. of Threads per inch	Diameter at bottom of Thread in inches	Distance over Flats in inches	Distance over Corners in inches	Thickness of Bolt Head in inches	Sectional Area at bottom of Thread in square inches
Fractional Sizes	Decimal Sizes						
$\frac{1}{4}$	·25	20	·186	·525	·606	·219	·027
$\frac{3}{8}$	·375	16	·266	·709	·819	·328	·068
$\frac{1}{2}$	·5	12	·393	·919	1·061	·437	·121
$\frac{5}{8}$	·625	11	·508	1·101	1·271	·547	·203
$\frac{3}{4}$	·75	10	·622	1·301	1·502	·656	·304
$\frac{7}{8}$	·875	9	·733	1·479	1·707	·766	·422
1	1·0	8	·840	1·670	1·928	·875	·554
$1\frac{1}{8}$	1·125	7	·942	1·860	2·143	·964	·697
$1\frac{1}{4}$	1·25	7	1·067	2·043	2·365	1·094	·894
$1\frac{3}{8}$	1·375	6	1·161	2·215	2·557	1·203	1·060
$1\frac{1}{2}$	1·5	6	1·286	2·413	2·787	1·312	1·300

HENDER, LEE & CO. LIMITED

CALCULATED WEIGHTS IN POUNDS OF WHITWORTH'S STANDARD BOLTS & NUTS

(Assuming Steel and Zinc)

SIZES OF BOLTS IN INCHES



Length
in inches

1/2 3/4 1 1 1/4 1 1/2 1 3/4 2 2 1/4 2 1/2 2 3/4 3 3 1/4 3 1/2 3 3/4 4 4 1/4 4 1/2 4 3/4 5 5 1/4 5 1/2 5 3/4 6 6 1/4 6 1/2 6 3/4 7 7 1/4 7 1/2 7 3/4 8 8 1/4 8 1/2 8 3/4 9 9 1/4 9 1/2 9 3/4 10 10 1/4 10 1/2 10 3/4 11 11 1/4 11 1/2 11 3/4 12 12 1/4 12 1/2 12 3/4 13 13 1/4 13 1/2 13 3/4 14 14 1/4 14 1/2 14 3/4 15 15 1/4 15 1/2 15 3/4 16 16 1/4 16 1/2 16 3/4 17 17 1/4 17 1/2 17 3/4 18 18 1/4 18 1/2 18 3/4 19 19 1/4 19 1/2 19 3/4 20 20 1/4 20 1/2 20 3/4 21 21 1/4 21 1/2 21 3/4 22 22 1/4 22 1/2 22 3/4 23 23 1/4 23 1/2 23 3/4 24 24 1/4 24 1/2 24 3/4 25 25 1/4 25 1/2 25 3/4 26 26 1/4 26 1/2 26 3/4 27 27 1/4 27 1/2 27 3/4 28 28 1/4 28 1/2 28 3/4 29 29 1/4 29 1/2 29 3/4 30 30 1/4 30 1/2 30 3/4 31 31 1/4 31 1/2 31 3/4 32 32 1/4 32 1/2 32 3/4 33 33 1/4 33 1/2 33 3/4 34 34 1/4 34 1/2 34 3/4 35 35 1/4 35 1/2 35 3/4 36 36 1/4 36 1/2 36 3/4 37 37 1/4 37 1/2 37 3/4 38 38 1/4 38 1/2 38 3/4 39 39 1/4 39 1/2 39 3/4 40 40 1/4 40 1/2 40 3/4 41 41 1/4 41 1/2 41 3/4 42 42 1/4 42 1/2 42 3/4 43 43 1/4 43 1/2 43 3/4 44 44 1/4 44 1/2 44 3/4 45 45 1/4 45 1/2 45 3/4 46 46 1/4 46 1/2 46 3/4 47 47 1/4 47 1/2 47 3/4 48 48 1/4 48 1/2 48 3/4 49 49 1/4 49 1/2 49 3/4 50 50 1/4 50 1/2 50 3/4 51 51 1/4 51 1/2 51 3/4 52 52 1/4 52 1/2 52 3/4 53 53 1/4 53 1/2 53 3/4 54 54 1/4 54 1/2 54 3/4 55 55 1/4 55 1/2 55 3/4 56 56 1/4 56 1/2 56 3/4 57 57 1/4 57 1/2 57 3/4 58 58 1/4 58 1/2 58 3/4 59 59 1/4 59 1/2 59 3/4 60 60 1/4 60 1/2 60 3/4 61 61 1/4 61 1/2 61 3/4 62 62 1/4 62 1/2 62 3/4 63 63 1/4 63 1/2 63 3/4 64 64 1/4 64 1/2 64 3/4 65 65 1/4 65 1/2 65 3/4 66 66 1/4 66 1/2 66 3/4 67 67 1/4 67 1/2 67 3/4 68 68 1/4 68 1/2 68 3/4 69 69 1/4 69 1/2 69 3/4 70 70 1/4 70 1/2 70 3/4 71 71 1/4 71 1/2 71 3/4 72 72 1/4 72 1/2 72 3/4 73 73 1/4 73 1/2 73 3/4 74 74 1/4 74 1/2 74 3/4 75 75 1/4 75 1/2 75 3/4 76 76 1/4 76 1/2 76 3/4 77 77 1/4 77 1/2 77 3/4 78 78 1/4 78 1/2 78 3/4 79 79 1/4 79 1/2 79 3/4 80 80 1/4 80 1/2 80 3/4 81 81 1/4 81 1/2 81 3/4 82 82 1/4 82 1/2 82 3/4 83 83 1/4 83 1/2 83 3/4 84 84 1/4 84 1/2 84 3/4 85 85 1/4 85 1/2 85 3/4 86 86 1/4 86 1/2 86 3/4 87 87 1/4 87 1/2 87 3/4 88 88 1/4 88 1/2 88 3/4 89 89 1/4 89 1/2 89 3/4 90 90 1/4 90 1/2 90 3/4 91 91 1/4 91 1/2 91 3/4 92 92 1/4 92 1/2 92 3/4 93 93 1/4 93 1/2 93 3/4 94 94 1/4 94 1/2 94 3/4 95 95 1/4 95 1/2 95 3/4 96 96 1/4 96 1/2 96 3/4 97 97 1/4 97 1/2 97 3/4 98 98 1/4 98 1/2 98 3/4 99 99 1/4 99 1/2 99 3/4 100 100 1/4 100 1/2 100 3/4 101 101 1/4 101 1/2 101 3/4 102 102 1/4 102 1/2 102 3/4 103 103 1/4 103 1/2 103 3/4 104 104 1/4 104 1/2 104 3/4 105 105 1/4 105 1/2 105 3/4 106 106 1/4 106 1/2 106 3/4 107 107 1/4 107 1/2 107 3/4 108 108 1/4 108 1/2 108 3/4 109 109 1/4 109 1/2 109 3/4 110 110 1/4 110 1/2 110 3/4 111 111 1/4 111 1/2 111 3/4 112 112 1/4 112 1/2 112 3/4 113 113 1/4 113 1/2 113 3/4 114 114 1/4 114 1/2 114 3/4 115 115 1/4 115 1/2 115 3/4 116 116 1/4 116 1/2 116 3/4 117 117 1/4 117 1/2 117 3/4 118 118 1/4 118 1/2 118 3/4 119 119 1/4 119 1/2 119 3/4 120 120 1/4 120 1/2 120 3/4 121 121 1/4 121 1/2 121 3/4 122 122 1/4 122 1/2 122 3/4 123 123 1/4 123 1/2 123 3/4 124 124 1/4 124 1/2 124 3/4 125 125 1/4 125 1/2 125 3/4 126 126 1/4 126 1/2 126 3/4 127 127 1/4 127 1/2 127 3/4 128 128 1/4 128 1/2 128 3/4 129 129 1/4 129 1/2 129 3/4 130 130 1/4 130 1/2 130 3/4 131 131 1/4 131 1/2 131 3/4 132 132 1/4 132 1/2 132 3/4 133 133 1/4 133 1/2 133 3/4 134 134 1/4 134 1/2 134 3/4 135 135 1/4 135 1/2 135 3/4 136 136 1/4 136 1/2 136 3/4 137 137 1/4 137 1/2 137 3/4 138 138 1/4 138 1/2 138 3/4 139 139 1/4 139 1/2 139 3/4 140 140 1/4 140 1/2 140 3/4 141 141 1/4 141 1/2 141 3/4 142 142 1/4 142 1/2 142 3/4 143 143 1/4 143 1/2 143 3/4 144 144 1/4 144 1/2 144 3/4 145 145 1/4 145 1/2 145 3/4 146 146 1/4 146 1/2 146 3/4 147 147 1/4 147 1/2 147 3/4 148 148 1/4 148 1/2 148 3/4 149 149 1/4 149 1/2 149 3/4 150 150 1/4 150 1/2 150 3/4 151 151 1/4 151 1/2 151 3/4 152 152 1/4 152 1/2 152 3/4 153 153 1/4 153 1/2 153 3/4 154 154 1/4 154 1/2 154 3/4 155 155 1/4 155 1/2 155 3/4 156 156 1/4 156 1/2 156 3/4 157 157 1/4 157 1/2 157 3/4 158 158 1/4 158 1/2 158 3/4 159 159 1/4 159 1/2 159 3/4 160 160 1/4 160 1/2 160 3/4 161 161 1/4 161 1/2 161 3/4 162 162 1/4 162 1/2 162 3/4 163 163 1/4 163 1/2 163 3/4 164 164 1/4 164 1/2 164 3/4 165 165 1/4 165 1/2 165 3/4 166 166 1/4 166 1/2 166 3/4 167 167 1/4 167 1/2 167 3/4 168 168 1/4 168 1/2 168 3/4 169 169 1/4 169 1/2 169 3/4 170 170 1/4 170 1/2 170 3/4 171 171 1/4 171 1/2 171 3/4 172 172 1/4 172 1/2 172 3/4 173 173 1/4 173 1/2 173 3/4 174 174 1/4 174 1/2 174 3/4 175 175 1/4 175 1/2 175 3/4 176 176 1/4 176 1/2 176 3/4 177 177 1/4 177 1/2 177 3/4 178 178 1/4 178 1/2 178 3/4 179 179 1/4 179 1/2 179 3/4 180 180 1/4 180 1/2 180 3/4 181 181 1/4 181 1/2 181 3/4 182 182 1/4 182 1/2 182 3/4 183 183 1/4 183 1/2 183 3/4 184 184 1/4 184 1/2 184 3/4 185 185 1/4 185 1/2 185 3/4 186 186 1/4 186 1/2 186 3/4 187 187 1/4 187 1/2 187 3/4 188 188 1/4 188 1/2 188 3/4 189 189 1/4 189 1/2 189 3/4 190 190 1/4 190 1/2 190 3/4 191 191 1/4 191 1/2 191 3/4 192 192 1/4 192 1/2 192 3/4 193 193 1/4 193 1/2 193 3/4 194 194 1/4 194 1/2 194 3/4 195 195 1/4 195 1/2 195 3/4 196 196 1/4 196 1/2 196 3/4 197 197 1/4 197 1/2 197 3/4 198 198 1/4 198 1/2 198 3/4 199 199 1/4 199 1/2 199 3/4 200 200 1/4 200 1/2 200 3/4 201 201 1/4 201 1/2 201 3/4 202 202 1/4 202 1/2 202 3/4 203 203 1/4 203 1/2 203 3/4 204 204 1/4 204 1/2 204 3/4 205 205 1/4 205 1/2 205 3/4 206 206 1/4 206 1/2 206 3/4 207 207 1/4 207 1/2 207 3/4 208 208 1/4 208 1/2 208 3/4 209 209 1/4 209 1/2 209 3/4 210 210 1/4 210 1/2 210 3/4 211 211 1/4 211 1/2 211 3/4 212 212 1/4 212 1/2 212 3/4 213 213 1/4 213 1/2 213 3/4 214 214 1/4 214 1/2 214 3/4 215 215 1/4 215 1/2 215 3/4 216 216 1/4 216 1/2 216 3/4 217 217 1/4 217 1/2 217 3/4 218 218 1/4 218 1/2 218 3/4 219 219 1/4 219 1/2 219 3/4 220 220 1/4 220 1/2 220 3/4 221 221 1/4 221 1/2 221 3/4 222 222 1/4 222 1/2 222 3/4 223 223 1/4 223 1/2 223 3/4 224 224 1/4 224 1/2 224 3/4 225 225 1/4 225 1/2 225 3/4 226 226 1/4 226 1/2 226 3/4 227 227 1/4 227 1/2 227 3/4 228 228 1/4 228 1/2 228 3/4 229 229 1/4 229 1/2 229 3/4 230 230 1/4 230 1/2 230 3/4 231 231 1/4 231 1/2 231 3/4 232 232 1/4 232 1/2 232 3/4 233 233 1/4 233 1/2 233 3/4 234 234 1/4 234 1/2 234 3/4 235 235 1/4 235 1/2 235 3/4 236 236 1/4 236 1/2 236 3/4 237 237 1/4 237 1/2 237 3/4 238 238 1/4 238 1/2 238 3/4 239 239 1/4 239 1/2 239 3/4 240 240 1/4 240 1/2 240 3/4 241 241 1/4 241 1/2 241 3/4 242 242 1/4 242 1/2 242 3/4 243 243 1/4 243 1/2 243 3/4 244 244 1/4 244 1/2 244 3/4 245 245 1/4 245 1/2 245 3/4 246 246 1/4 246 1/2 246 3/4 247 247 1/4 247 1/2 247 3/4 248 248 1/4 248 1/2 248 3/4 249 249 1/4 249 1/2 249 3/4 250 250 1/4 250 1/2 250 3/4 251 251 1/4 251 1/2 251 3/4 252 252 1/4 252 1/2 252 3/4 253 253 1/4 253 1/2 253 3/4 254 254 1/4 254 1/2 254 3/4 255 255 1/4 255 1/2 255 3/4 256 256 1/4 256 1/2 256 3/4 257 257 1/4 257 1/2 257 3/4 258 258 1/4 258 1/2 258 3/4 259 259 1/4 259 1/2 259 3/4 260 260 1/4 260 1/2 260 3/4 261 261 1/4 261 1/2 261 3/4 262 262 1/4 262 1/2 262 3/4 263 263 1/4 263 1/2 263 3/4 264 264 1/4 264 1/2 264 3/4 265 265 1/4 265 1/2 265 3/4 266 266 1/4 266 1/2 266 3/4 267 267 1/4 267 1/2 267 3/4 268 268 1/4 268 1/2 268 3/4 269 269 1/4 269 1/2 269 3/4 270 270 1/4 270 1/2 270 3/4 271 271 1/4 271 1/2 271 3/4 272 272 1/4 272 1/2 272 3/4 273 273 1/4 273 1/2 273 3/4 274 274 1/4 274 1/2 274 3/4 275 275 1/4 275 1/2 275 3/4 276 276 1/4 276 1/2 276 3/4 277 277 1/4 277 1/2 277 3/4 278 278 1/4 278 1/2 278 3/4 279 279 1/4 279 1/2 279 3/4 280 280 1/4 280 1/2 280 3/4 281 281 1/4 281 1/2 281 3/4 282 282 1/4 282 1/2 282 3/4 283 283 1/4 283 1/2 283 3/4 284 284 1/4 284 1/2 284 3/4 285 285 1/4 285 1/2 285 3/4 286 286 1/4 286 1/2 286 3/4 287 287 1/4 287 1/2 287 3/4 288 288 1/4 288 1/2 288 3/4 289 289 1/4 289 1/2 289 3/4 290 290 1/4 290 1/2 290 3/4 291 291 1/4 291 1/2 291 3/4 292 292 1/4 292 1/2 292 3/4 293 293 1/4 293 1/2 293 3/4 294 294 1/4 294 1/2 294 3/4 295 295 1/4 295 1/2 295 3/4 296 296 1/4 296 1/2 296 3/4 297 297 1/4 297 1/2 297 3/4 298 298 1/4 298 1/2 298 3/4 299 299 1/4 299 1/2 299 3/4 300 300 1/4 300 1/2 300 3/4 301 301 1/4 301 1/2 301 3/4 302 302 1/4 302 1/2 302 3/4 303 303 1/4 303 1/2 303 3/4 304 304 1/4 304 1/2 304 3/4 305 305 1/4 305 1/2 305 3/4 306 306 1/4 306 1/2 306 3/4 307 307 1/4 307 1/2 307 3/4 308 308 1/4 308 1/2 308 3/4 309 309 1/4 309 1/2 309 3/4 310 310 1/4 310 1/2 310 3/4 311 311 1/4 311 1/2 311 3/4 312 312 1/4 312 1/2 312 3/4 313 313 1/4 313 1/2 313 3/4 314 314 1/4 314 1/2 314 3/4 315 315 1/4 315 1/2 315 3/4 316 316 1/4 316 1/2 316 3/4 317 317 1/4 317 1/2 317 3/4 318 318 1/4 318 1/2 318 3/4 319 319 1/4 319 1/2 319 3/4 320 320 1/4 320 1/2 320 3/4 321 321 1/4 321 1/2 321 3/4 322 322 1/4 322 1/2 322 3/4 323 323 1/4 323 1/2 323 3/4 324 324 1/4 324 1/2 324 3/4 325 325 1/4 325 1/2 325 3/4 326 326 1/4 326 1/2 326 3/4 327 327 1/4 327 1/2 327 3/4 328 328 1/4 328 1/2 328 3/4 329 329 1/4 329 1/2 329 3/4 330 330 1/4 330 1/2 330 3/4 331 331 1/4 331 1/2 331 3/4 332 332 1/4 332 1/2 332 3/4 333 333 1/4 333 1/2 333 3/4 334 334 1/4 334 1/2 334 3/4 335 335 1/4 335 1/2 335 3/4 336 336 1/4 336 1/2 336 3/4 337 337 1/4 337 1/2 337 3/4 338 338 1/4 338 1/2 338 3/4 339 339 1/4 339 1/2 339 3/4 340 340 1/4 340 1/2 340 3/4 341 341 1/4 341 1/2 341 3/4 342 342 1/4 342 1/2 342 3/4 343 343 1/4 343 1/2 343 3/4 344 344 1/4 344 1/2 344 3/4 345 345 1/4 345 1/2 345 3/4 346 346 1/4 346 1/2 346 3/4 347 347 1/4 347 1/2 347 3/4 348 348 1/4 348 1/2 348 3/4 349 349 1/4 349 1/2 349 3/4 350 350 1/4 350 1/2 350 3/4 351 351 1/4 351 1/2 351 3/4 352 352 1/4 352 1/2 352 3/4 353 353 1/4 353 1/2 353 3/4 354 354 1/4 354 1/2 354 3/4 355 355 1/4 355 1/2 355 3/4 356 356 1/4 356 1/2 356 3/4 357 357 1/4 357 1/2 357 3/4 358 358 1/4 358 1/2 358 3/4 359 359 1/4 359 1/2 359 3/4 360 360 1/4 360 1/2 360 3/4 361 361 1/4 361 1/2 361 3/4 362 362 1/4 362 1/2 362 3/4 363 363 1/4 363 1/2 363 3/4 364 364 1/4 364 1/2 364 3/4 365 365 1/4 365 1/2 365 3/4 366 366 1/4 366 1/2 366 3/4 367 367 1/4 367 1/2 367 3/4 368 368 1/4 368 1/2 368 3/4 369 369 1/4 369 1/2 369 3/4 370 370 1/4 370 1/2 370 3/4 371 371 1/4 371 1/2 371 3/4 372 372 1/4 372 1/2 372 3/4 373 373 1/4 373 1/2 373 3/4 374 374 1/4 374 1/2 374 3/4 375 375 1/4 375 1/2 375 3/4 376 376 1/4 376 1/2 376 3/4 377 377 1/4 377 1/2 377 3/4 378 378 1/4 378 1/2 378 3/4 379 379 1/4 379 1/2 379 3/4 380 380 1/4 380 1/2 380 3/4 381 381 1/4 381 1/2 381 3/4 382 382 1/4 382 1/2 382 3/4 383 383 1/4 383 1/2 383 3/4 384 384 1/4 384 1/2 384 3/4 385 385 1/4 385 1/2 385 3/4 386 386 1/4 386 1/2 386 3/4 387 387 1/4 387 1/2 387 3/4 388 388 1/4 388 1/2 388 3/4 389 389 1/4 389 1/2 389 3/4 390 390 1/4 390 1/2 390 3/4 391 391 1/4 391 1/2 391 3/4 392 392 1/4 392 1/2 392 3/4 393 393 1/4 393 1/2 393 3/4 394 394 1/4 394 1/2 394 3/4 395 395 1/4 395 1/2 395 3/4 396 396 1/4 396 1/2 396 3/4 397 397 1/4 397 1/2 397 3/4 398 398 1/4 398 1/2 398 3/4 399 399 1/4 399 1/2 399 3/4 400 400 1/4 400 1/2 400 3/4 401 401 1/4 401 1/2 401 3/4 402 402 1/4 402 1/2 402 3/4 403 403 1/4 403 1/2 403 3/4 404 404 1/4 404 1/2 404 3/4 405 405 1/4 405 1/2 405 3/4 406 406 1/4 406 1/2 406 3/4 407 407 1/4 407 1/2 407 3/4 408 408 1/4 408 1/2 408 3/4 409 409 1/4 409 1/2 409 3/4 410 410 1/4 410 1/2 410 3/4 411 411 1/4 411 1/2 411 3/4 412 412 1/4 412 1/2 412 3/4 413 413 1/4 413 1/2 413 3/4 414 414 1/4 414 1/2 414 3/4 415 415 1/4 415 1/2 415 3/4 416 416 1/4 416 1/2 416 3/4 417 417 1/4 417 1/2 417 3/4 418 418 1/4 418 1/2 418 3/4 419 419 1/4 419 1/2 419 3/4 420 420 1/4 420 1/2 420 3/4 421 421 1/4 421 1/2 421 3/4 422 422 1/4 422 1/2 422 3/4 423 423 1/4 423 1/2 423 3/4 424 424 1/4 424 1/2 424 3/4 425 425 1/4 425 1/2 425 3/4 426 426 1/4 426 1/2 426 3/4 427 427 1/4 427 1/2 427 3/4 428 428 1/4 428 1/2 428 3/4 429 429 1/4 429 1/2 429 3/4 430 430 1/4 430 1/2 430 3/4 431 431 1/4 431 1/2 431 3/4 432 432 1/4 432 1/2 432 3/4 433 433 1/4 433 1/2 433 3/4 434 434 1/4 434 1/2 434 3/4 435 435 1/4 435 1/2 435 3/4 436 436 1/4 436 1/2 436 3/4 437 437 1/4 437 1/2 437 3/4 438 438 1/4 438 1/2 438 3/4 439 439 1/4 439 1/2 439 3/4 440 440 1/4 440 1/2 440 3/4 441 441 1/4 441 1/2 441 3/4 442 442 1/4 442 1/2 442 3/4 443 443 1/4 44

DORMAN, LLOYD & CO., LIMITED.

BOLTS, NUTS AND WASHERS.

APPROXIMATE WEIGHTS AND SIZES.



LEWIS BOLTS AND NUTS.

Dimensions of Bolts and Nuts in In.

Hex. Bolt D.	Hex. Nut			Hex. Bolt			Hex. Nut		
	d	D	L	d	D	L	d	D	L
1/4	1/4	3/8	1 1/2	1/4	3/8	1 1/2	1/4	3/8	1 1/2
5/16	5/16	7/8	2 1/4	5/16	7/8	2 1/4	5/16	7/8	2 1/4
3/8	3/8	1 1/8	3 1/4	3/8	1 1/8	3 1/4	3/8	1 1/8	3 1/4
1/2	1/2	1 3/4	4 3/4	1/2	1 3/4	4 3/4	1/2	1 3/4	4 3/4
5/8	5/8	2 1/8	6 1/4	5/8	2 1/8	6 1/4	5/8	2 1/8	6 1/4
3/4	3/4	2 3/4	7 3/4	3/4	2 3/4	7 3/4	3/4	2 3/4	7 3/4
7/8	7/8	3 1/4	9 1/4	7/8	3 1/4	9 1/4	7/8	3 1/4	9 1/4
1	1	4	11 1/4	1	4	11 1/4	1	4	11 1/4

ORDINARY WASHERS.

Thickness of Bolt in inches	Outside Diameter of Washer in inches	Thickness in inches	Weight in lbs. per 100
1/4	3/8	1/8	100
5/16	7/8	3/16	150
3/8	1 1/8	1/4	200
1/2	1 3/4	5/16	300
5/8	2 1/8	3/8	400
3/4	2 3/4	1/2	500
7/8	3 1/4	5/8	600
1	4	3/4	700



BEVELLED WASHERS.

Thickness of Bolt in inches	Outside Diameter of Washer in inches	Thickness in inches	Weight in lbs. per 100
1/4	3/8	1/8	100
5/16	7/8	3/16	150
3/8	1 1/8	1/4	200
1/2	1 3/4	5/16	300
5/8	2 1/8	3/8	400
3/4	2 3/4	1/2	500
7/8	3 1/4	5/8	600
1	4	3/4	700

APPROXIMATE WEIGHTS AND SIZES OF GAS PIPING.

Outside Diameter in inches	1/2	1	1 1/2	2	2 1/2
Approximate Weight in lbs. per foot	1.5	3.5	7.5	12.5	18.5
Weight in lbs. per foot, steel	1.5	3.5	7.5	12.5	18.5

STEEL CUR-HEADED BOLTS

APPROXIMATE WEIGHT IN LBS. OF HOT STEEL CUR-HEADED BOLTS

Length in
inches

HEADS OF BOLTS IN INCHES

1 1/2

2

3

4

5

6

10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94
96
98
100

Approximate
weight in lbs. of
100 bolts

1.75 2.15 2.55 2.95 3.35 3.75

Weight in lbs. of
100 bolts in length of head

100 100 100 100 100 100

DORMAN, LONG & CO. LIMITED.

DECIMALS OF A FOOT FOR EACH $\frac{1}{4}$ TH
OF AN INCH.

Inch	0	1	2	3	4	5	6	7	8	9	10	11
0	0	0030	0060	0090	0120	0150	0180	0210	0240	0270	0300	0330
$\frac{1}{16}$	0015	0045	0075	0105	0135	0165	0195	0225	0255	0285	0315	0345
$\frac{1}{8}$	0030	0060	0090	0120	0150	0180	0210	0240	0270	0300	0330	0360
$\frac{3}{16}$	0045	0075	0105	0135	0165	0195	0225	0255	0285	0315	0345	0375
$\frac{1}{4}$	0060	0090	0120	0150	0180	0210	0240	0270	0300	0330	0360	0390
$\frac{5}{16}$	0075	0105	0135	0165	0195	0225	0255	0285	0315	0345	0375	0405
$\frac{3}{8}$	0090	0120	0150	0180	0210	0240	0270	0300	0330	0360	0390	0420
$\frac{7}{16}$	0105	0135	0165	0195	0225	0255	0285	0315	0345	0375	0405	0435
$\frac{1}{2}$	0120	0150	0180	0210	0240	0270	0300	0330	0360	0390	0420	0450
$\frac{9}{16}$	0135	0165	0195	0225	0255	0285	0315	0345	0375	0405	0435	0465
$\frac{5}{8}$	0150	0180	0210	0240	0270	0300	0330	0360	0390	0420	0450	0480
$\frac{11}{16}$	0165	0195	0225	0255	0285	0315	0345	0375	0405	0435	0465	0495
$\frac{3}{4}$	0180	0210	0240	0270	0300	0330	0360	0390	0420	0450	0480	0510
$\frac{13}{16}$	0195	0225	0255	0285	0315	0345	0375	0405	0435	0465	0495	0525
$\frac{7}{8}$	0210	0240	0270	0300	0330	0360	0390	0420	0450	0480	0510	0540
$\frac{15}{16}$	0225	0255	0285	0315	0345	0375	0405	0435	0465	0495	0525	0555
1	0240	0270	0300	0330	0360	0390	0420	0450	0480	0510	0540	0570
$\frac{1}{16}$	0255	0285	0315	0345	0375	0405	0435	0465	0495	0525	0555	0585
$\frac{1}{8}$	0270	0300	0330	0360	0390	0420	0450	0480	0510	0540	0570	0600
$\frac{3}{16}$	0285	0315	0345	0375	0405	0435	0465	0495	0525	0555	0585	0615
$\frac{1}{4}$	0300	0330	0360	0390	0420	0450	0480	0510	0540	0570	0600	0630
$\frac{5}{16}$	0315	0345	0375	0405	0435	0465	0495	0525	0555	0585	0615	0645
$\frac{3}{8}$	0330	0360	0390	0420	0450	0480	0510	0540	0570	0600	0630	0660
$\frac{7}{16}$	0345	0375	0405	0435	0465	0495	0525	0555	0585	0615	0645	0675
$\frac{1}{2}$	0360	0390	0420	0450	0480	0510	0540	0570	0600	0630	0660	0690
$\frac{9}{16}$	0375	0405	0435	0465	0495	0525	0555	0585	0615	0645	0675	0705
$\frac{5}{8}$	0390	0420	0450	0480	0510	0540	0570	0600	0630	0660	0690	0720
$\frac{11}{16}$	0405	0435	0465	0495	0525	0555	0585	0615	0645	0675	0705	0735
$\frac{3}{4}$	0420	0450	0480	0510	0540	0570	0600	0630	0660	0690	0720	0750
$\frac{13}{16}$	0435	0465	0495	0525	0555	0585	0615	0645	0675	0705	0735	0765
$\frac{7}{8}$	0450	0480	0510	0540	0570	0600	0630	0660	0690	0720	0750	0780
$\frac{15}{16}$	0465	0495	0525	0555	0585	0615	0645	0675	0705	0735	0765	0795
1	0480	0510	0540	0570	0600	0630	0660	0690	0720	0750	0780	0810

DORMAN, LONG & CO. LIMITED.









DECIMAL EQUIVALENTS.

EXACT DECIMAL EQUIVALENTS OF THE FRACTION OF AN INCH.

Fractions		Decimals	Fractions		Decimals
$\frac{1}{16}$		015625	$\frac{1}{16}$		515625
$\frac{1}{8}$		03125	$\frac{1}{8}$		53125
$\frac{3}{16}$		046875	$\frac{3}{16}$		546875
$\frac{1}{4}$		0625	$\frac{1}{4}$		5625
$\frac{5}{16}$		078125	$\frac{5}{16}$		578125
$\frac{3}{8}$		09375	$\frac{3}{8}$		59375
$\frac{7}{16}$		109375	$\frac{7}{16}$		609375
$\frac{1}{2}$		125	$\frac{1}{2}$		625
$\frac{9}{16}$		140625	$\frac{9}{16}$		640625
$\frac{5}{8}$		15625	$\frac{5}{8}$		65625
$\frac{11}{16}$		171875	$\frac{11}{16}$		671875
$\frac{3}{4}$		1875	$\frac{3}{4}$		6875
$\frac{13}{16}$		203125	$\frac{13}{16}$		703125
$\frac{7}{8}$		21875	$\frac{7}{8}$		71875
$\frac{15}{16}$		234375	$\frac{15}{16}$		734375
		25			75
$\frac{1}{16}$		265625	$\frac{1}{16}$		765625
$\frac{1}{8}$		28125	$\frac{1}{8}$		78125
$\frac{3}{16}$		296875	$\frac{3}{16}$		796875
$\frac{1}{4}$		3125	$\frac{1}{4}$		8125
$\frac{5}{16}$		328125	$\frac{5}{16}$		828125
$\frac{3}{8}$		34375	$\frac{3}{8}$		84375
$\frac{7}{16}$		359375	$\frac{7}{16}$		859375
$\frac{1}{2}$		375	$\frac{1}{2}$		875
$\frac{9}{16}$		390625	$\frac{9}{16}$		890625
$\frac{5}{8}$		40625	$\frac{5}{8}$		90625
$\frac{11}{16}$		421875	$\frac{11}{16}$		921875
$\frac{3}{4}$		4375	$\frac{3}{4}$		9375
$\frac{13}{16}$		453125	$\frac{13}{16}$		953125
$\frac{7}{8}$		46875	$\frac{7}{8}$		96875
$\frac{15}{16}$		484375	$\frac{15}{16}$		984375
		5			1 1'00

DORMAN, LONG & CO., LIMITED.

MOMENTS OF INERTIA OF VARIOUS SECTIONS.

Sections	Moments of Inertia about xx	Sections	Moments of Inertia about xx
	$\frac{B, D^3}{12}$		$\frac{\pi (D^4 - d^4)}{64}$ $- 0.491 (D^4 - d^4)$
	$\frac{B^3, D}{3}$		$\frac{B, D^3}{36}$
	$\frac{B (D^3 - d^3)}{12}$		$\frac{B, D^3}{12}$
	$\frac{\pi D^4}{64}$ $- 0.491 D^4$		$\frac{B, D^3}{4}$

AREAS OF SMALL CIRCLES, ADVANCING BY 32nds OF AN INCH.

Diameter in inches	Area in square inches	Diameter in inches	Area in square inches	Diameter in inches	Area in square inches	Diameter in inches	Area in square inches
$\frac{1}{32}$	0008	$\frac{1}{8}$	0621	$\frac{1}{2}$	2217	$\frac{1}{2}$	4794
$\frac{1}{16}$	0031	$\frac{3}{16}$	0757	$\frac{5}{8}$	3485	$\frac{3}{4}$	5135
$\frac{3}{32}$	0069	$\frac{1}{4}$	0866	$\frac{3}{4}$	2769	$\frac{1}{2}$	5291
$\frac{1}{8}$	0123	$\frac{5}{16}$	1104	$\frac{7}{8}$	3068	$\frac{1}{2}$	6013
$\frac{5}{32}$	0192	$\frac{3}{8}$	1296	$\frac{1}{2}$	3392	$\frac{3}{4}$	6450
$\frac{3}{16}$	0276	$\frac{1}{2}$	1503	$\frac{1}{2}$	3712	$\frac{1}{2}$	6803
$\frac{1}{4}$	0376	$\frac{5}{8}$	1726	$\frac{3}{4}$	4057	$\frac{1}{2}$	7371
$\frac{3}{8}$	0491	$\frac{3}{4}$	1963	$\frac{1}{2}$	4418	1	7854

DORMAN, LONG & CO. LIMITED.

AREAS OF CIRCLES ADVANCING BY EIGHTHS.

Diameter	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
0		0.02	0.09	0.10	0.16	0.307	0.44	0.60
1	0.785	0.894	1.021	1.165	1.767	2.074	2.405	2.761
2	3.142	3.547	4.090	4.730	5.490	6.272	7.085	7.929
3	7.068	7.957	8.996	10.146	11.421	12.821	14.347	15.999
4	12.566	14.064	15.768	17.590	19.533	21.600	23.792	26.110
5	19.635	21.634	23.849	26.290	28.960	31.760	34.691	37.753
6	28.274	30.465	32.830	35.380	38.115	40.933	43.835	46.821
7	38.484	40.871	43.442	46.198	49.140	52.169	55.285	58.487
8	50.265	52.848	55.620	58.580	61.728	64.964	68.288	71.699
9	63.617	66.397	69.261	72.309	75.541	78.857	82.258	85.744
10	78.540	81.516	84.630	87.881	91.270	94.796	98.459	102.259
11	95.033	98.200	101.500	104.933	108.500	112.200	116.033	119.900
12	113.09	116.47	119.90	123.47	127.19	131.00	134.89	138.87
13	132.74	136.30	139.90	143.50	147.25	151.00	154.80	158.65
14	153.94	157.60	161.40	165.20	169.10	173.00	176.90	180.80
15	176.71	180.50	184.40	188.40	192.40	196.50	200.60	204.70
16	201.06	205.00	209.00	213.10	217.20	221.30	225.40	229.50
17	226.98	231.00	235.10	239.20	243.30	247.40	251.50	255.60
18	254.47	258.60	262.80	267.00	271.20	275.40	279.60	283.80
19	283.53	287.80	292.10	296.40	300.70	305.00	309.30	313.60
20	314.16	318.50	322.90	327.30	331.70	336.10	340.50	344.90
21	346.36	350.80	355.30	359.80	364.30	368.80	373.30	377.80
22	380.15	384.70	389.30	393.90	398.50	403.10	407.70	412.30
23	415.45	420.10	424.80	429.50	434.20	438.90	443.60	448.30
24	452.39	457.10	461.80	466.50	471.20	475.90	480.60	485.30
25	490.97	495.70	500.40	505.10	510.70	515.40	520.10	524.80
26	530.23	535.00	539.80	544.60	549.40	554.20	559.00	563.80
27	571.26	576.10	581.00	585.90	590.80	595.70	600.60	605.50
28	613.05	618.00	623.00	628.00	633.00	638.00	643.00	648.00
29	655.61	660.70	665.80	670.90	676.00	681.10	686.20	691.30
30	709.90	715.10	720.30	725.50	730.70	735.90	741.10	746.30
31	754.77	760.00	765.20	770.40	775.60	780.80	786.00	791.20
32	804.25	810.50	816.80	823.10	829.40	835.70	842.00	848.30
33	855.30	861.70	868.10	874.50	881.00	887.40	893.80	900.20
34	907.92	914.40	920.90	927.40	933.90	940.40	946.90	953.40
35	952.11	959.70	967.30	974.90	982.50	990.10	997.70	1005.30
36	1017.9	1025.0	1032.1	1039.2	1046.3	1053.5	1060.7	1068.0
37	1075.2	1082.5	1089.8	1097.1	1104.5	1111.8	1119.2	1126.6
38	1134.1	1141.6	1149.1	1156.6	1164.2	1171.7	1179.3	1186.9
39	1194.6	1202.3	1210.0	1217.7	1225.4	1233.2	1241.0	1248.8
40	1256.6	1264.5	1272.4	1280.3	1288.2	1296.2	1304.2	1312.2
41	1320.3	1328.3	1336.4	1344.5	1352.7	1360.8	1369.0	1377.2
42	1385.4	1393.7	1402.0	1410.3	1418.6	1427.0	1435.4	1443.8
43	1452.2	1460.7	1469.1	1477.6	1486.2	1494.7	1503.3	1511.9
44	1520.5	1529.2	1537.9	1546.6	1555.3	1564.0	1572.8	1581.6
45	1590.4	1599.3	1608.2	1617.0	1626.0	1634.9	1643.9	1652.9
46	1661.9	1670.9	1680.0	1689.1	1698.2	1707.4	1716.5	1725.7
47	1734.9	1744.2	1753.5	1762.7	1772.1	1781.4	1790.8	1800.1
48	1809.6	1819.0	1828.5	1837.9	1847.5	1857.0	1866.5	1876.1
49	1885.7	1895.4	1905.0	1914.7	1924.4	1934.2	1943.9	1953.7
50	1963.5	1973.3	1983.2	1993.1	2003.0	2012.9	2022.8	2032.8

DORMAN, LONG & CO. LIMITED.

AREAS OF CIRCLES ADVANCING BY EIGHTHS.

Diameter	0	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$
51	2042.5	2054.8	2067.1	2079.4	2091.7	2104.0	2116.3	2128.6
52	2123.7	2135.9	2148.2	2160.5	2172.8	2185.1	2197.4	2209.7
53	2206.2	2218.6	2230.9	2243.3	2255.6	2267.9	2280.3	2292.6
54	2290.2	2302.6	2314.9	2327.3	2339.6	2351.9	2364.3	2376.6
55	2375.8	2388.2	2399.5	2411.9	2424.2	2436.5	2448.9	2461.2
56	2463.0	2475.4	2487.7	2499.9	2512.3	2524.6	2536.9	2549.3
57	2561.8	2574.2	2586.5	2598.8	2611.2	2623.5	2635.8	2648.2
58	2642.1	2654.5	2666.8	2679.1	2691.5	2703.8	2716.1	2728.5
59	2734.0	2746.4	2758.7	2771.0	2783.4	2795.7	2808.0	2820.4
60	2827.4	2839.8	2852.1	2864.5	2876.8	2889.1	2901.5	2913.8
61	2922.5	2934.9	2947.2	2959.5	2971.9	2984.2	2996.5	3008.9
62	3013.1	3025.5	3037.8	3050.2	3062.5	3074.8	3087.2	3099.5
63	3117.2	3129.6	3141.9	3154.3	3166.6	3178.9	3191.3	3203.6
64	3217.0	3229.4	3241.7	3254.1	3266.4	3278.8	3291.1	3303.5
65	3318.3	3330.7	3343.0	3355.4	3367.7	3380.0	3392.4	3404.7
66	3421.2	3433.6	3445.9	3458.3	3470.6	3482.9	3495.3	3507.6
67	3525.7	3538.1	3550.4	3562.8	3575.1	3587.5	3599.8	3612.2
68	3631.7	3644.1	3656.4	3668.8	3681.1	3693.5	3705.8	3718.2
69	3739.3	3751.7	3764.0	3776.4	3788.7	3801.1	3813.4	3825.8
70	3845.5	3857.9	3870.2	3882.6	3894.9	3907.3	3919.6	3932.0
71	3959.2	3971.6	3983.9	3996.3	4008.6	4021.0	4033.3	4045.7
72	4071.5	4083.9	4096.2	4108.6	4120.9	4133.3	4145.6	4158.0
73	4185.4	4197.8	4210.1	4222.5	4234.8	4247.2	4259.5	4271.9
74	4300.8	4313.2	4325.5	4337.9	4350.2	4362.6	4374.9	4387.3
75	4417.9	4430.3	4442.6	4455.0	4467.3	4479.7	4492.0	4504.4
76	4536.5	4548.9	4561.2	4573.6	4585.9	4598.3	4610.6	4623.0
77	4656.6	4669.0	4681.3	4693.7	4706.0	4718.4	4730.7	4743.1
78	4778.4	4790.8	4803.1	4815.5	4827.8	4840.2	4852.5	4864.9
79	4901.7	4914.1	4926.4	4938.8	4951.1	4963.5	4975.8	4988.2
80	5026.5	5038.9	5051.2	5063.6	5075.9	5088.3	5100.6	5113.0
81	5153.0	5165.4	5177.7	5190.1	5202.4	5214.8	5227.1	5239.5
82	5281.0	5293.4	5305.7	5318.1	5330.4	5342.8	5355.1	5367.5
83	5410.6	5423.0	5435.3	5447.7	5460.0	5472.4	5484.7	5497.1
84	5541.8	5554.2	5566.5	5578.9	5591.2	5603.6	5615.9	5628.3
85	5674.5	5686.9	5699.2	5711.6	5723.9	5736.3	5748.6	5761.0
86	5808.8	5821.2	5833.5	5845.9	5858.2	5870.6	5882.9	5895.3
87	5944.7	5957.1	5969.4	5981.8	5994.1	6006.5	6018.8	6031.2
88	6082.1	6094.5	6106.8	6119.2	6131.5	6143.9	6156.2	6168.6
89	6221.1	6233.5	6245.8	6258.2	6270.5	6282.9	6295.2	6307.6
90	6361.7	6374.1	6386.4	6398.8	6411.1	6423.5	6435.8	6448.2
91	6503.9	6516.3	6528.6	6541.0	6553.3	6565.7	6578.0	6590.4
92	6647.6	6659.9	6672.3	6684.6	6697.0	6709.3	6721.7	6734.0
93	6792.9	6805.3	6817.6	6830.0	6842.3	6854.7	6867.0	6879.4
94	6939.8	6952.2	6964.5	6976.9	6989.2	7001.6	7013.9	7026.3
95	7088.2	7100.6	7112.9	7125.3	7137.6	7150.0	7162.3	7174.7
96	7238.2	7250.6	7262.9	7275.3	7287.6	7300.0	7312.3	7324.7
97	7389.8	7402.2	7414.5	7426.9	7439.2	7451.6	7463.9	7476.3
98	7543.0	7555.4	7567.7	7580.1	7592.4	7604.8	7617.1	7629.5
99	7697.7	7710.1	7722.4	7734.8	7747.1	7759.5	7771.8	7784.2
100	7854.0	7866.4	7878.7	7891.1	7903.4	7915.8	7928.1	7940.5

DORMAN, LONG & CO. LIMITED.

CIRCUMFERENCES OF CIRCLES ADVANCING
BY EIGHTHS.

Diameter	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
0		363	725	1088	1451	1813	2176	2539
1	3 142	3 524	3 907	4 290	4 712	5 135	5 558	5 980
2	6 283	6 676	7 069	7 461	7 854	8 247	8 639	9 032
3	9 424	9 817	10 210	10 603	10 996	11 388	11 781	12 174
4	12 566	12 959	13 352	13 744	14 137	14 530	14 923	15 315
5	15 708	16 101	16 493	16 886	17 279	17 671	18 064	18 457
6	18 850	19 242	19 635	20 028	20 420	20 813	21 206	21 598
7	21 991	22 384	22 777	23 169	23 562	23 955	24 347	24 740
8	25 133	25 525	25 918	26 311	26 704	27 096	27 489	27 882
9	28 274	28 667	29 060	29 452	29 845	30 238	30 631	31 023
10	31 416	31 809	32 201	32 594	32 987	33 379	33 772	34 165
11	34 558	34 950	35 343	35 736	36 128	36 521	36 914	37 306
12	37 699	38 092	38 485	38 877	39 270	39 663	40 055	40 448
13	40 841	41 233	41 626	42 019	42 412	42 804	43 197	43 590
14	43 982	44 375	44 768	45 160	45 553	45 946	46 338	46 731
15	47 124	47 517	47 909	48 302	48 695	49 087	49 480	49 873
16	50 265	50 658	51 051	51 444	51 836	52 229	52 622	53 014
17	53 407	53 800	54 193	54 585	54 978	55 371	55 763	56 156
18	56 549	56 941	57 334	57 727	58 119	58 512	58 905	59 298
19	59 690	60 083	60 476	60 868	61 261	61 654	62 046	62 439
20	62 832	63 225	63 617	64 010	64 403	64 795	65 188	65 581
21	65 973	66 366	66 759	67 152	67 544	67 937	68 330	68 722
22	69 115	69 508	69 900	70 293	70 686	71 079	71 471	71 864
23	72 257	72 649	73 042	73 435	73 827	74 220	74 613	75 006
24	75 399	75 791	76 184	76 576	76 969	77 362	77 754	78 147
25	78 541	78 933	79 325	79 718	80 111	80 503	80 896	81 289
26	81 682	82 074	82 467	82 860	83 252	83 645	84 038	84 430
27	84 823	85 216	85 608	86 001	86 394	86 786	87 179	87 572
28	87 965	88 357	88 750	89 143	89 535	89 928	90 321	90 713
29	91 106	91 499	91 892	92 284	92 677	93 070	93 462	93 855
30	94 248	94 640	95 033	95 426	95 819	96 211	96 604	96 997
31	97 389	97 782	98 175	98 567	98 960	99 353	99 746	100 14
32	100 53	100 92	101 32	101 71	102 10	102 49	102 89	103 28
33	103 67	104 07	104 46	104 85	105 24	105 64	106 03	106 42
34	106 81	107 21	107 60	107 99	108 38	108 78	109 17	109 56
35	109 95	110 35	110 74	111 13	111 53	111 92	112 31	112 70
36	113 10	113 49	113 88	114 28	114 67	115 06	115 45	115 85
37	116 24	116 63	117 02	117 42	117 81	118 20	118 60	118 99
38	119 39	119 77	120 17	120 56	120 95	121 34	121 74	122 13
39	122 52	122 91	123 31	123 70	124 09	124 49	124 88	125 27
40	125 66	126 06	126 45	126 84	127 23	127 63	128 02	128 41
41	128 81	129 20	129 59	129 98	130 38	130 77	131 16	131 55
42	131 95	132 34	132 73	133 12	133 52	133 91	134 30	134 70
43	135 09	135 48	135 87	136 27	136 66	137 05	137 44	137 84
44	138 23	138 62	139 02	139 41	139 80	140 19	140 59	140 98
45	141 37	141 76	142 16	142 55	142 94	143 34	143 73	144 12
46	144 51	144 91	145 30	145 69	146 08	146 48	146 87	147 26
47	147 65	148 05	148 44	148 83	149 23	149 62	150 01	150 40
48	150 80	151 19	151 58	151 97	152 37	152 76	153 15	153 55
49	153 94	154 33	154 72	155 12	155 51	155 90	156 29	156 69
50	157 08	157 47	157 85	158 26	158 65	159 04	159 44	159 83

DORMAN, LONG & CO. LIMITED.

CIRCUMFERENCES OF CIRCLES ADVANCING
BY EIGHTHS.

Diameter	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
51	162 22	160 61	161 01	161 40	161 79	162 18	162 58	162 97
52	163 35	163 76	164 16	164 54	164 93	165 33	165 72	166 11
53	165 50	164 90	165 29	165 68	166 08	166 47	166 86	167 25
54	169 65	170 04	170 43	170 82	171 22	171 61	172 00	172 39
55	172 79	173 18	173 57	173 97	174 36	174 75	175 14	175 54
56	175 93	176 32	176 71	177 11	177 50	177 89	178 29	178 68
57	179 07	179 46	179 86	180 25	180 64	181 03	181 43	181 82
58	182 21	182 61	183 00	183 39	183 78	184 18	184 57	184 96
59	185 35	185 75	186 14	186 53	186 92	187 32	187 71	188 10
60	188 50	188 89	189 28	189 67	190 07	190 46	190 85	191 24
61	191 64	192 03	192 42	192 82	193 21	193 60	193 99	194 39
62	194 78	195 17	195 56	195 96	196 35	196 74	197 13	197 53
63	197 92	198 31	198 71	199 10	199 49	199 88	200 28	200 67
64	201 05	201 45	201 85	202 24	202 63	203 03	203 42	203 81
65	204 20	204 60	204 99	205 38	205 77	206 17	206 56	206 95
66	207 35	207 74	208 13	208 53	208 92	209 31	209 70	210 09
67	210 49	210 88	211 27	211 66	212 05	212 45	212 84	213 24
68	213 63	214 02	214 41	214 81	215 20	215 59	215 98	216 38
69	216 77	217 16	217 55	217 95	218 34	218 73	219 13	219 52
70	219 91	220 30	220 70	221 09	221 48	221 87	222 27	222 66
71	223 05	223 45	223 84	224 23	224 62	225 02	225 41	225 80
72	226 19	226 59	226 98	227 37	227 77	228 16	228 56	228 95
73	229 34	229 73	230 12	230 51	230 91	231 30	231 69	232 09
74	232 48	232 87	233 26	233 66	234 05	234 44	234 83	235 23
75	235 62	236 01	236 40	236 80	237 19	237 58	237 98	238 37
76	238 76	239 15	239 55	239 94	240 33	240 72	241 12	241 51
77	241 90	242 30	242 69	243 08	243 47	243 87	244 26	244 65
78	245 04	245 44	245 83	246 22	246 62	247 01	247 40	247 79
79	248 19	248 58	248 97	249 36	249 76	250 15	250 54	250 93
80	251 33	251 72	252 11	252 51	252 90	253 29	253 68	254 08
81	254 47	254 86	255 25	255 65	256 04	256 45	256 83	257 22
82	257 61	258 00	258 40	258 79	259 18	259 57	259 97	260 36
83	260 75	261 14	261 54	261 93	262 32	262 72	263 11	263 50
84	263 89	264 29	264 68	265 07	265 46	265 86	266 25	266 64
85	267 04	267 43	267 82	268 21	268 61	269 00	269 39	269 78
86	270 18	270 57	270 96	271 36	271 75	272 14	272 53	272 93
87	273 32	273 71	274 10	274 50	274 89	275 28	275 67	276 07
88	276 46	276 85	277 25	277 64	278 03	278 42	278 82	279 21
89	279 60	279 99	280 39	280 78	281 17	281 57	281 96	282 35
90	282 74	283 14	283 53	283 92	284 31	284 71	285 10	285 49
91	285 88	286 28	286 67	287 06	287 45	287 85	288 24	288 63
92	289 03	289 42	289 81	290 20	290 60	290 99	291 38	291 78
93	292 17	292 56	292 96	293 35	293 74	294 13	294 52	294 92
94	295 31	295 70	296 10	296 49	296 88	297 27	297 67	298 06
95	298 45	298 84	299 24	299 63	300 02	300 41	300 81	301 20
96	301 59	301 99	302 38	302 77	303 16	303 56	303 95	304 34
97	304 73	305 13	305 52	305 91	306 31	306 70	307 09	307 48
98	307 88	308 27	308 66	309 05	309 45	309 84	310 23	310 62
99	311 02	311 41	311 80	312 20	312 59	312 98	313 37	313 77
100	314 16	314 55	314 94	315 34	315 73	316 12	316 52	316 91

DORMAN, LONG & CO. LIMITED.

SQUARES OF NUMBERS AND FRACTIONAL PARTS.

No	0	1	2	3	4	5	6	7
0		0156	0625	1406	2500	3906	5625	7656
1	1	1-2656	1-4625	1-8906	2-2500	2-6406	3-0625	3-5156
2	4	4-5156	5-0625	5-6406	6-2500	6-8906	7-5625	8-2656
3	9	9-7656	10-5625	11-3906	12-2500	13-1406	14-0625	15-0156
4	16	17-0156	18-0625	19-1406	20-2500	21-3906	22-5625	23-7656
5	25	26-2656	27-5625	28-8906	30-2500	31-6406	33-0625	34-5156
6	36	37-0156	39-0625	40-6406	42-2500	43-8906	45-5625	47-2656
7	49	50-7656	52-5625	54-3906	56-2500	58-1406	60-0625	62-0156
8	64	66-0156	68-0625	70-1406	72-2500	74-3906	76-5625	78-7656
9	81	83-2656	85-5625	87-8906	90-2500	92-6406	95-0625	97-5156
10	100	102-5156	105-0625	107-6406	110-2500	112-8906	115-5625	118-2656
11	121	123-7656	126-5625	129-3906	132-2500	135-1406	138-0625	141-0156
12	144	147-0156	150-0625	153-1406	156-2500	159-3906	162-5625	165-7656
13	169	172-2656	175-5625	178-8906	182-2500	185-6406	189-0625	192-5156
14	196	199-5156	203-0625	206-6406	210-2500	213-8906	217-5625	221-2656
15	225	228-7656	232-5625	236-3906	240-2500	244-1406	248-0625	252-0156
16	256	260-0156	264-0625	268-1406	272-2500	276-3906	280-5625	284-7656
17	289	293-2656	297-5625	301-8906	306-2500	310-6406	315-0625	319-5156
18	324	328-5156	333-0625	337-6406	342-2500	346-8906	351-5625	356-2656
19	361	365-7656	370-5625	375-3906	380-2500	385-1406	390-0625	395-0156
20	400	405-0156	410-0625	415-1406	420-2500	425-3906	430-5625	435-7656
21	441	446-2656	451-5625	456-8906	462-2500	467-6406	473-0625	478-5156
22	484	489-5156	496-0625	500-6406	506-2500	511-8906	517-5625	523-2656
23	529	534-7656	540-5625	546-3906	552-2500	558-1406	564-0625	570-0156
24	576	582-0156	588-0625	594-1406	600-2500	606-3906	612-5625	618-7656
25	625	631-2656	637-5625	643-8906	650-2500	656-6406	663-0625	669-5156
26	676	682-5156	689-0625	696-6406	702-2500	708-8906	715-5625	722-2656
27	729	735-7656	742-5625	749-3906	756-2500	763-1406	770-0625	777-0156
28	784	791-0156	798-0625	806-1406	812-2500	819-3906	826-5625	833-7656
29	841	848-2656	855-5625	862-8906	870-2500	877-6406	885-0625	892-5156
30	900	907-5156	915-0625	922-6406	930-2500	937-8906	945-5625	953-2656

DORMAN, LONG & CO. LIMITED.

SQUARES OF NUMBERS AND FRACTIONAL PARTS.

N ₂	0	5	10	15	20	25	30	35	40
31	961	980	999	1018	1037	1056	1075	1094	1113
32	1024	1043	1062	1081	1100	1119	1138	1157	1176
33	1089	1108	1127	1146	1165	1184	1203	1222	1241
34	1156	1175	1194	1213	1232	1251	1270	1289	1308
35	1225	1244	1263	1282	1301	1320	1339	1358	1377
36	1296	1315	1334	1353	1372	1391	1410	1429	1448
37	1369	1388	1407	1426	1445	1464	1483	1502	1521
38	1444	1463	1482	1501	1520	1539	1558	1577	1596
39	1521	1540	1559	1578	1597	1616	1635	1654	1673
40	1600	1619	1638	1657	1676	1695	1714	1733	1752
41	1681	1700	1719	1738	1757	1776	1795	1814	1833
42	1764	1783	1802	1821	1840	1859	1878	1897	1916
43	1849	1868	1887	1906	1925	1944	1963	1982	2001
44	1936	1955	1974	1993	2012	2031	2050	2069	2088
45	2025	2044	2063	2082	2101	2120	2139	2158	2177
46	2116	2135	2154	2173	2192	2211	2230	2249	2268
47	2209	2228	2247	2266	2285	2304	2323	2342	2361
48	2304	2323	2342	2361	2380	2399	2418	2437	2456
49	2401	2420	2439	2458	2477	2496	2515	2534	2553
50	2500	2519	2538	2557	2576	2595	2614	2633	2652
51	2601	2620	2639	2658	2677	2696	2715	2734	2753
52	2704	2723	2742	2761	2780	2799	2818	2837	2856
53	2809	2828	2847	2866	2885	2904	2923	2942	2961
54	2916	2935	2954	2973	2992	3011	3030	3049	3068
55	3025	3044	3063	3082	3101	3120	3139	3158	3177
56	3136	3155	3174	3193	3212	3231	3250	3269	3288
57	3249	3268	3287	3306	3325	3344	3363	3382	3401
58	3364	3383	3402	3421	3440	3459	3478	3497	3516
59	3481	3500	3519	3538	3557	3576	3595	3614	3633
60	3600	3619	3638	3657	3676	3695	3714	3733	3752

DORMAN, LONG & CO. LIMITED.

CUBES OF NUMBERS AND FRACTIONAL PARTS.

No	0	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
0		000	000	000	000	000	000	000
1	1	1 444	1 361	2 600	3 375	4 281	5 360	6 592
2	8	1 596	11 381	15 636	15 625	18 088	20 797	23 764
3	27	30 419	34 125	36 443	42 375	47 636	52 734	58 186
4	64	70 128	79 766	88 740	91 125	98 932	107 172	115 857
5	125	134 611	144 703	150 267	166 375	177 079	190 108	202 779
6	216	228 192	244 141	259 684	274 625	290 175	307 547	324 951
7	343	361 702	381 078	401 131	421 875	443 322	465 484	488 373
8	512	536 377	561 516	587 438	614 125	641 619	669 922	699 045
9	729	758 598	791 453	825 975	867 125	901 666	926 950	962 967
10	1000	1037 977	1086 251	1116 771	1157 625	1199 463	1242 297	1286 139
11	1331	1376 353	1422 228	1471 018	1520 875	1571 010	1622 234	1674 561
12	1728	1772 564	1823 266	1880 115	1953 125	2012 307	2072 672	2134 232
13	2197	2260 986	2326 203	2392 662	2460 315	2529 354	2599 609	2671 154
14	2744	2818 158	2893 641	2970 459	3048 625	3128 150	3209 047	3291 326
15	3375	3460 080	3546 573	3634 506	3723 875	3814 697	3906 984	4000 748
16	4096	4192 758	4291 016	4390 803	4492 125	4594 264	4698 222	4803 420
17	4913	5022 174	5132 953	5245 350	5359 375	5475 041	5592 359	5711 342
18	5832	5954 946	6079 391	6204 146	6331 625	6460 838	6591 797	6724 514
19	6859	6995 260	7133 326	7273 195	7414 875	7558 385	7703 734	7850 956
20	8000	8150 339	8303 766	8458 490	8615 125	8773 682	8934 172	9096 607
21	9261	9427 361	9595 703	9766 037	9938 375	10112 729	10289 106	10467 529
22	10648	10830 533	11015 141	11201 834	11390 625	11581 525	11774 547	11969 701
23	12167	12366 455	12568 075	12771 381	12977 875	13186 072	13396 484	13609 123
24	13824	14041 127	14260 516	14482 178	14706 125	14932 369	15160 922	15391 785
25	15625	15860 549	16098 453	16338 725	16581 375	16826 416	17073 859	17323 717
26	17576	17830 721	18087 281	18347 521	18609 625	18874 213	19141 297	19410 889
27	19683	19957 643	20234 328	20514 563	20796 875	21081 760	21369 234	21659 311
28	21952	22247 315	22545 266	22845 865	23149 125	23455 057	23763 672	24074 982
29	24389	24705 736	25025 203	25347 412	25672 375	26000 104	26330 609	26663 504
30	27000	27338 901	27680 641	28025 209	28372 625	28722 900	29076 047	29432 076

DORMAN, LONG & CO LIMITED

CUBES OF NUMBERS AND FRACTIONAL PARTS.

No	0	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
31	2979	30158.33	30517.33	30876.33	31235.33	31594.33	31953.33	32312.33	32671.33
32	32768	33158.33	33517.33	33876.33	34235.33	34594.33	34953.33	35312.33	35671.33
33	35937	36312.33	36671.33	37030.33	37389.33	37748.33	38107.33	38466.33	38825.33
34	39304	39679.33	40038.33	40397.33	40756.33	41115.33	41474.33	41833.33	42192.33
35	42875	43240.33	43599.33	43958.33	44317.33	44676.33	45035.33	45394.33	45753.33
36	46656	47021.33	47380.33	47739.33	48098.33	48457.33	48816.33	49175.33	49534.33
37	50653	51018.33	51377.33	51736.33	52095.33	52454.33	52813.33	53172.33	53531.33
38	54872	55237.33	55596.33	55955.33	56314.33	56673.33	57032.33	57391.33	57750.33
39	59314	59679.33	60038.33	60397.33	60756.33	61115.33	61474.33	61833.33	62192.33
40	64000	64365.33	64724.33	65083.33	65442.33	65801.33	66160.33	66519.33	66878.33
41	68921	69286.33	69645.33	70004.33	70363.33	70722.33	71081.33	71440.33	71799.33
42	74088	74453.33	74812.33	75171.33	75530.33	75889.33	76248.33	76607.33	76966.33
43	79507	79872.33	80231.33	80590.33	80949.33	81308.33	81667.33	82026.33	82385.33
44	85124	85489.33	85848.33	86207.33	86566.33	86925.33	87284.33	87643.33	88002.33
45	91125	91490.33	91849.33	92208.33	92567.33	92926.33	93285.33	93644.33	94003.33
46	97336	97701.33	98060.33	98419.33	98778.33	99137.33	99496.33	99855.33	100214.33
47	103853	104218.33	104577.33	104936.33	105295.33	105654.33	106013.33	106372.33	106731.33
48	110688	111053.33	111412.33	111771.33	112130.33	112489.33	112848.33	113207.33	113566.33
49	117849	118214.33	118573.33	118932.33	119291.33	119650.33	120009.33	120368.33	120727.33
50	126400	126765.33	127124.33	127483.33	127842.33	128201.33	128560.33	128919.33	129278.33
51	133281	133646.33	134005.33	134364.33	134723.33	135082.33	135441.33	135800.33	136159.33
52	140488	140853.33	141212.33	141571.33	141930.33	142289.33	142648.33	143007.33	143366.33
53	148017	148382.33	148741.33	149100.33	149459.33	149818.33	150177.33	150536.33	150895.33
54	154864	155229.33	155588.33	155947.33	156306.33	156665.33	157024.33	157383.33	157742.33
55	163075	163440.33	163800.33	164159.33	164518.33	164877.33	165236.33	165595.33	165954.33
56	172616	172981.33	173340.33	173699.33	174058.33	174417.33	174776.33	175135.33	175494.33
57	183513	183878.33	184237.33	184596.33	184955.33	185314.33	185673.33	186032.33	186391.33
58	195812	196177.33	196536.33	196895.33	197254.33	197613.33	197972.33	198331.33	198690.33
59	209614	210000.33	210359.33	210718.33	211077.33	211436.33	211795.33	212154.33	212513.33
60	216000	216365.33	216724.33	217083.33	217442.33	217801.33	218160.33	218519.33	218878.33

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
1	1	1	1.0000	1.0000	50	2500	125000	7.0711	3.6840
2	4	8	1.4142	1.2599	51	2601	132651	7.1414	3.7084
3	9	27	1.7321	1.4422	52	2704	140608	7.2111	3.7325
4	16	64	2.0000	1.5874	53	2809	148977	7.2801	3.7563
5	25	125	2.2361	1.7100	54	2916	157464	7.3435	3.7798
6	36	216	2.4495	1.8171	55	3025	166375	7.4162	3.8030
7	49	343	2.4495	1.9129	56	3136	175616	7.4833	3.8259
8	64	512	2.8284	2.0000	57	3249	185193	7.5496	3.8485
9	81	729	2.0000	2.0801	58	3364	195112	7.6158	3.8709
10	100	1000	3.1623	2.1544	59	3481	205379	7.6811	3.8930
11	121	1331	3.3166	2.2240	60	3600	216000	7.7460	3.9149
12	144	1728	3.4641	2.2894	61	3721	226981	7.8102	3.9365
13	169	2197	3.6056	2.3513	62	3844	238328	7.8740	3.9579
14	196	2744	3.7417	2.4101	63	3969	250047	7.9373	3.9791
15	225	3375	3.8730	2.4662	64	4096	262144	8.0000	4.0000
16	256	4096	4.0000	2.5198	65	4225	274625	8.0623	4.0207
17	289	4913	4.1231	2.5713	66	4356	287496	8.1240	4.0412
18	324	5832	4.2426	2.6207	67	4489	300763	8.1854	4.0615
19	361	6859	4.3589	2.6684	68	4624	314432	8.2462	4.0817
20	400	8000	4.4721	2.7144	69	4761	328509	8.3066	4.1016
21	441	9261	4.5826	2.7589	70	4900	343000	8.3666	4.1213
22	484	10648	4.6904	2.8020	71	5041	357911	8.4261	4.1408
23	529	12167	4.7968	2.8439	72	5184	373248	8.4853	4.1602
24	576	13824	4.8990	2.8845	73	5329	389017	8.5440	4.1793
25	625	15625	5.0000	2.9240	74	5476	405224	8.6023	4.1983
26	676	17576	5.0890	2.9625	75	5625	421875	8.6603	4.2172
27	729	19683	5.1962	3.0000	76	5776	438976	8.7178	4.2358
28	784	21952	5.2915	3.0366	77	5929	456533	8.7750	4.2543
29	841	24389	5.3852	3.0723	78	6084	474552	8.8318	4.2727
30	900	27000	5.4772	3.1072	79	6241	493039	8.8882	4.2908
31	961	29791	5.5677	3.1414	80	6400	512000	8.9443	4.3089
32	1024	32768	5.6569	3.1748	81	6561	531441	9.0000	4.3267
33	1089	35937	5.7446	3.2075	82	6724	551368	9.0554	4.3445
34	1156	39304	5.8310	3.2396	83	6889	571787	9.1104	4.3621
35	1225	42875	5.9161	3.2711	84	7056	592704	9.1652	4.3796
36	1296	46656	6.0000	3.3019	85	7225	614125	9.2196	4.3968
37	1369	50653	6.0828	3.3322	86	7396	636056	9.2736	4.4140
38	1444	54872	6.1644	3.3620	87	7569	658503	9.3274	4.4310
39	1521	59319	6.2450	3.3912	88	7744	681472	9.3808	4.4480
40	1600	64000	6.3246	3.4200	89	7921	704969	9.4340	4.4647
41	1681	68921	6.4031	3.4482	90	8100	729000	9.4868	4.4814
42	1764	74088	6.4807	3.4760	91	8281	753571	9.5394	4.4979
43	1849	79507	6.5574	3.5034	92	8464	778688	9.5917	4.5144
44	1936	85184	6.6332	3.5303	93	8649	804357	9.6437	4.5307
45	2025	91125	6.7082	3.5569	94	8836	830584	9.6954	4.5468
46	2116	97336	6.7823	3.5830	95	9025	857375	9.7468	4.5629
47	2209	103823	6.8557	3.6088	96	9216	884736	9.7980	4.5789
48	2304	110592	6.9282	3.6342	97	9409	912673	9.8489	4.5947
49	2401	117649	7.0000	3.6593	98	9604	941192	9.8996	4.6104
					99	9801	970299	9.9499	4.6261

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
100	10000	1000000	100.000	4.64159	101	10201	1030301	101.000	4.66103
101	10201	1030301	101.000	4.68129	102	10404	1064864	102.000	4.70097
102	10404	1064864	102.000	4.72087	103	10609	1092727	103.000	4.72087
103	10609	1092727	103.000	4.74087	104	10816	1122968	104.000	4.76087
104	10816	1122968	104.000	4.78087	105	11025	1155575	105.000	4.80087
105	11025	1155575	105.000	4.82087	106	11236	1189648	106.000	4.84087
106	11236	1189648	106.000	4.86087	107	11449	1225187	107.000	4.88087
107	11449	1225187	107.000	4.90087	108	11664	1262200	108.000	4.92087
108	11664	1262200	108.000	4.94087	109	11881	1300689	109.000	4.96087
109	11881	1300689	109.000	4.98087	110	12100	1340660	110.000	4.99999
110	12100	1340660	110.000	5.01999	111	12321	1382121	111.000	5.03999
111	12321	1382121	111.000	5.05999	112	12544	1425072	112.000	5.07999
112	12544	1425072	112.000	5.09999	113	12769	1469523	113.000	5.11999
113	12769	1469523	113.000	5.13999	114	12996	1515484	114.000	5.15999
114	12996	1515484	114.000	5.17999	115	13225	1562955	115.000	5.19999
115	13225	1562955	115.000	5.21999	116	13456	1611936	116.000	5.23999
116	13456	1611936	116.000	5.25999	117	13689	1662427	117.000	5.27999
117	13689	1662427	117.000	5.29999	118	13924	1714438	118.000	5.31999
118	13924	1714438	118.000	5.33999	119	14161	1767969	119.000	5.35999
119	14161	1767969	119.000	5.37999	120	14400	1823040	120.000	5.39999
120	14400	1823040	120.000	5.41999	121	14641	1879661	121.000	5.43999
121	14641	1879661	121.000	5.45999	122	14884	1937842	122.000	5.47999
122	14884	1937842	122.000	5.49999	123	15129	1997583	123.000	5.51999
123	15129	1997583	123.000	5.53999	124	15376	2058894	124.000	5.55999
124	15376	2058894	124.000	5.57999	125	15625	2121775	125.000	5.59999
125	15625	2121775	125.000	5.61999	126	15876	2186226	126.000	5.63999
126	15876	2186226	126.000	5.65999	127	16129	2252257	127.000	5.67999
127	16129	2252257	127.000	5.69999	128	16384	2319868	128.000	5.71999
128	16384	2319868	128.000	5.73999	129	16641	2389059	129.000	5.75999
129	16641	2389059	129.000	5.77999	130	16900	2459840	130.000	5.79999
130	16900	2459840	130.000	5.81999	131	17161	2532221	131.000	5.83999
131	17161	2532221	131.000	5.85999	132	17424	2606292	132.000	5.87999
132	17424	2606292	132.000	5.89999	133	17689	2682053	133.000	5.91999
133	17689	2682053	133.000	5.93999	134	17956	2759504	134.000	5.95999
134	17956	2759504	134.000	5.97999	135	18225	2838645	135.000	5.99999
135	18225	2838645	135.000	6.01999	136	18496	2919476	136.000	6.03999
136	18496	2919476	136.000	6.05999	137	18769	3001997	137.000	6.07999
137	18769	3001997	137.000	6.09999	138	19044	3086208	138.000	6.11999
138	19044	3086208	138.000	6.13999	139	19321	3172119	139.000	6.15999
139	19321	3172119	139.000	6.17999	140	19600	3259740	140.000	6.19999
140	19600	3259740	140.000	6.21999	141	19881	3349071	141.000	6.23999
141	19881	3349071	141.000	6.25999	142	20164	3440192	142.000	6.27999
142	20164	3440192	142.000	6.29999	143	20449	3533093	143.000	6.31999
143	20449	3533093	143.000	6.33999	144	20736	3627774	144.000	6.35999
144	20736	3627774	144.000	6.37999	145	21025	3724235	145.000	6.39999
145	21025	3724235	145.000	6.41999	146	21316	3822476	146.000	6.43999
146	21316	3822476	146.000	6.45999	147	21609	3922497	147.000	6.47999
147	21609	3922497	147.000	6.49999	148	21904	4024308	148.000	6.51999
148	21904	4024308	148.000	6.53999	149	22201	4127909	149.000	6.55999
149	22201	4127909	149.000	6.57999	150	22500	4233300	150.000	6.59999

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
200	40000	8000000	200	5.996	280	78400	21952000	16.935	6.583
201	40401	8120601	201	5.998	281	78961	22185281	16.940	6.588
202	40804	8242408	202	5.999	282	79524	22420808	16.945	6.593
203	41209	8365427	203	6.000	283	80089	22658797	16.950	6.598
204	41616	8489664	204	6.001	284	80656	22900368	16.955	6.603
205	42025	8615125	205	6.002	285	81225	23144640	16.960	6.608
206	42436	8741816	206	6.003	286	81796	23391744	16.965	6.613
207	42849	8869743	207	6.004	287	82369	23641713	16.970	6.618
208	43264	8998912	208	6.005	288	82944	23894568	16.975	6.623
209	43681	9129329	209	6.006	289	83521	24150333	16.980	6.628
210	44100	9261000	210	6.007	290	84100	24409040	16.985	6.633
211	44521	9393931	211	6.008	291	84681	24670713	16.990	6.638
212	44944	9528128	212	6.009	292	85264	24935376	16.995	6.643
213	45369	9663597	213	6.010	293	85849	25203063	16.999	6.648
214	45796	9800344	214	6.011	294	86436	25473816	17.004	6.653
215	46225	9938375	215	6.012	295	87025	25747665	17.009	6.658
216	46656	10077704	216	6.013	296	87616	26024640	17.014	6.663
217	47089	10218331	217	6.014	297	88209	26304783	17.019	6.668
218	47524	10360268	218	6.015	298	88804	26588128	17.024	6.673
219	47961	10503529	219	6.016	299	89401	26874703	17.029	6.678
220	48400	10648112	220	6.017	300	90000	27164560	17.034	6.683
221	48841	10794021	221	6.018	301	90601	27457729	17.039	6.688
222	49284	10941264	222	6.019	302	91204	27754248	17.044	6.693
223	49729	11089847	223	6.020	303	91809	28054163	17.049	6.698
224	50176	11239776	224	6.021	304	92416	28357512	17.054	6.703
225	50625	11391065	225	6.022	305	93025	28664333	17.059	6.708
226	51076	11543724	226	6.023	306	93636	28974672	17.064	6.713
227	51529	11697769	227	6.024	307	94249	29288567	17.069	6.718
228	51984	11853216	228	6.025	308	94864	29606048	17.074	6.723
229	52441	12009171	229	6.026	309	95481	29927153	17.079	6.728
230	52900	12166640	230	6.027	310	96100	30251824	17.084	6.733
231	53361	12325631	231	6.028	311	96721	30580103	17.089	6.738
232	53824	12486168	232	6.029	312	97344	30912032	17.094	6.743
233	54289	12648267	233	6.030	313	97969	31247653	17.099	6.748
234	54756	12811944	234	6.031	314	98596	31586912	17.104	6.753
235	55225	12977205	235	6.032	315	99225	31930865	17.109	6.758
236	55696	13144064	236	6.033	316	99856	32278568	17.114	6.763
237	56169	13312537	237	6.034	317	100489	32630067	17.119	6.768
238	56644	13482640	238	6.035	318	101124	32985416	17.124	6.773
239	57121	13654389	239	6.036	319	101761	33344673	17.129	6.778
240	57600	13827792	240	6.037	320	102400	33707888	17.134	6.783
241	58081	13992865	241	6.038	321	103041	34075003	17.139	6.788
242	58564	14159616	242	6.039	322	103684	34446168	17.144	6.793
243	59049	14328061	243	6.040	323	104329	34821433	17.149	6.798
244	59536	14498224	244	6.041	324	104976	35200848	17.154	6.803
245	60025	14670113	245	6.042	325	105625	35584463	17.159	6.808
246	60516	14843744	246	6.043	326	106276	35972332	17.164	6.813
247	61009	15019133	247	6.044	327	106929	36364503	17.169	6.818
248	61504	15196296	248	6.045	328	107584	36760928	17.174	6.823
249	62001	15375249	249	6.046	329	108241	37161653	17.179	6.828

DORMAN, LONG & CO., LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No	Square	Cube	Square Root	Cube Root	No	Square	Cube	Square Root	Cube Root
300	90000	27000000	300	6.942	301	90601	27183001	301	6.943
301	90601	27270901	302	6.944	302	91204	27364804	302	6.945
302	91204	27454804	303	6.945	303	91809	27458709	303	6.946
303	91809	27548709	304	6.946	304	92416	27552616	304	6.947
304	92416	27642616	305	6.947	305	93025	27646525	305	6.948
305	93025	27736525	306	6.948	306	93636	27736436	306	6.949
306	93636	27826436	307	6.949	307	94249	27826349	307	6.950
307	94249	27916349	308	6.950	308	94864	27916264	308	6.951
308	94864	28006264	309	6.951	309	95481	28006181	309	6.952
309	95481	28096181	310	6.952	310	96100	28096100	310	6.953
310	96100	28186100	311	6.953	311	96721	28186021	311	6.954
311	96721	28276021	312	6.954	312	97344	28275944	312	6.955
312	97344	28365944	313	6.955	313	97969	28365869	313	6.956
313	97969	28455869	314	6.956	314	98596	28455796	314	6.957
314	98596	28545796	315	6.957	315	99225	28545725	315	6.958
315	99225	28635725	316	6.958	316	99856	28635656	316	6.959
316	99856	28725656	317	6.959	317	100489	28725589	317	6.960
317	100489	28815589	318	6.960	318	101124	28815524	318	6.961
318	101124	28905524	319	6.961	319	101761	28905461	319	6.962
319	101761	29005461	320	6.962	320	102400	29005400	320	6.963
320	102400	29095400	321	6.963	321	103041	29095341	321	6.964
321	103041	29185341	322	6.964	322	103684	29185284	322	6.965
322	103684	29275284	323	6.965	323	104329	29275229	323	6.966
323	104329	29365229	324	6.966	324	104976	29365176	324	6.967
324	104976	29455176	325	6.967	325	105625	29455125	325	6.968
325	105625	29545125	326	6.968	326	106276	29545076	326	6.969
326	106276	29635076	327	6.969	327	106929	29635029	327	6.970
327	106929	29725029	328	6.970	328	107584	29724984	328	6.971
328	107584	29814984	329	6.971	329	108241	29814941	329	6.972
329	108241	29904941	330	6.972	330	108900	29904900	330	6.973
330	108900	30004800	331	6.973	331	109561	30004761	331	6.974
331	109561	30094761	332	6.974	332	110224	30094724	332	6.975
332	110224	30184724	333	6.975	333	110889	30184689	333	6.976
333	110889	30274689	334	6.976	334	111556	30274656	334	6.977
334	111556	30364656	335	6.977	335	112225	30364625	335	6.978
335	112225	30454625	336	6.978	336	112896	30454596	336	6.979
336	112896	30544596	337	6.979	337	113569	30544569	337	6.980
337	113569	30634569	338	6.980	338	114244	30634544	338	6.981
338	114244	30724544	339	6.981	339	114921	30724521	339	6.982
339	114921	30814521	340	6.982	340	115600	30814500	340	6.983
340	115600	30904500	341	6.983	341	116281	30904481	341	6.984
341	116281	31004481	342	6.984	342	116964	31004464	342	6.985
342	116964	31094464	343	6.985	343	117649	31094449	343	6.986
343	117649	31184449	344	6.986	344	118336	31184436	344	6.987
344	118336	31274436	345	6.987	345	119025	31274425	345	6.988
345	119025	31364425	346	6.988	346	119716	31364416	346	6.989
346	119716	31454416	347	6.989	347	120409	31454409	347	6.990
347	120409	31544409	348	6.990	348	121104	31544404	348	6.991
348	121104	31634404	349	6.991	349	121801	31634401	349	6.992
349	121801	31724401							

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
400	160000	64000000	400.000	7.3681	450	202500	91125000	21.2132	7.6631
401	160801	64481201	20.0250	7.3742	451	203401	91733851	21.2368	7.6622
402	161604	64884808	20.0499	7.3803	452	204304	92345408	21.2603	7.6744
403	162409	65290827	20.0748	7.3864	453	205209	92959677	21.2838	7.6801
404	163216	65699264	20.0996	7.3925	454	206116	93576664	21.3073	7.6857
405	164025	66109125	20.1244	7.3986	455	207025	94196375	21.3307	7.6914
406	164836	66520416	20.1494	7.4047	456	207936	94818816	21.3542	7.6970
407	165649	66933149	20.1742	7.4108	457	208849	95443963	21.3776	7.7026
408	166464	67347312	20.1990	7.4169	458	209764	96071912	21.4009	7.7082
409	167281	67762921	20.2237	7.4229	459	210681	96702579	21.4243	7.7138
410	168100	68180000	20.2485	7.4290	460	211600	97336000	21.4476	7.7194
411	168921	68598551	20.2731	7.4350	461	212521	97972181	21.4709	7.7250
412	169744	69018584	20.2978	7.4410	462	213444	98611128	21.4942	7.7306
413	170569	69440129	20.3224	7.4470	463	214369	99252847	21.5174	7.7362
414	171396	69863284	20.3470	7.4530	464	215296	99896734	21.5407	7.7418
415	172225	70287955	20.3715	7.4590	465	216225	100544625	21.5639	7.7473
416	173056	70714136	20.3961	7.4650	466	217156	101194696	21.5870	7.7529
417	173889	71141817	20.4206	7.4710	467	218089	101847563	21.6102	7.7584
418	174724	71570992	20.4450	7.4770	468	219024	102503232	21.6333	7.7639
419	175561	72001671	20.4695	7.4829	469	219961	103161709	21.6564	7.7695
420	176400	72433800	20.4939	7.4889	470	220900	103823000	21.6795	7.7750
421	177241	72867381	20.5183	7.4948	471	221841	104487311	21.7025	7.7805
422	178084	73302416	20.5426	7.5007	472	222784	105154048	21.7256	7.7860
423	178929	73738907	20.5670	7.5067	473	223729	105823317	21.7486	7.7915
424	179776	74176856	20.5913	7.5126	474	224676	106496424	21.7715	7.7970
425	180625	74616265	20.6155	7.5185	475	225625	107171875	21.7945	7.8025
426	181476	75057136	20.6398	7.5244	476	226576	107850176	21.8174	7.8079
427	182329	75499469	20.6640	7.5302	477	227529	108531333	21.8403	7.8134
428	183184	75943264	20.6882	7.5361	478	228484	109215352	21.8632	7.8188
429	184041	76388521	20.7123	7.5420	479	229441	109902239	21.8861	7.8243
430	184900	76835200	20.7364	7.5478	480	230400	110592000	21.9089	7.8297
431	185761	77283321	20.7605	7.5537	481	231361	111284641	21.9317	7.8352
432	186624	77732896	20.7846	7.5595	482	232324	111980168	21.9545	7.8406
433	187489	78183927	20.8087	7.5654	483	233289	112678587	21.9773	7.8460
434	188356	78636404	20.8327	7.5712	484	234256	113379904	22.0000	7.8514
435	189225	79090325	20.8567	7.5770	485	235225	114084125	22.0227	7.8568
436	190096	79545696	20.8806	7.5828	486	236196	114791256	22.0454	7.8622
437	190969	79992617	20.9045	7.5886	487	237169	115501303	22.0681	7.8676
438	191844	80441088	20.9284	7.5944	488	238144	116214272	22.0907	7.8730
439	192721	80891019	20.9523	7.6001	489	239121	116930169	22.1133	7.8784
440	193600	81342400	20.9762	7.6059	490	240100	117649000	22.1359	7.8837
441	194481	81795221	21.0000	7.6117	491	241081	118370771	22.1585	7.8891
442	195364	82249488	21.0238	7.6174	492	242064	119095488	22.1811	7.8944
443	196249	82705207	21.0476	7.6232	493	243049	119823157	22.2036	7.8998
444	197136	83162384	21.0713	7.6289	494	244036	120553784	22.2261	7.9051
445	198025	83621015	21.0950	7.6346	495	245025	121287375	22.2486	7.9105
446	198916	84081104	21.1187	7.6403	496	246016	122023936	22.2711	7.9158
447	199809	84542651	21.1424	7.6460	497	247009	122763473	22.2935	7.9211
448	200704	85005664	21.1660	7.6517	498	248004	123505992	22.3159	7.9264
449	201601	85470139	21.1896	7.6574	499	249001	124251499	22.3383	7.9317

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
500	250000	125000000	22 3607	7 9370	550	302500	166375000	23 4521	8 1432
501	251001	125751501	22 3830	7 9423	551	305001	167284151	23 4734	8 1492
502	252004	126506008	22 4054	7 9476	552	304704	168196608	23 4947	8 1551
503	253009	127263527	22 4277	7 9528	553	305309	169112577	23 5160	8 1611
504	254016	128024064	22 4499	7 9581	554	306916	170031464	23 5372	8 1670
505	255025	128787625	22 4722	7 9634	555	309025	170953875	23 5584	8 1729
506	256036	129554216	22 4944	7 9686	556	309136	171876616	23 5797	8 1788
507	257049	130323843	22 5167	7 9739	557	310249	172800693	23 6009	8 1847
508	258064	131096512	22 5389	7 9791	558	311364	173741112	23 6222	8 1906
509	259081	131872229	22 5610	7 9843	559	312481	174676379	23 6434	8 1965
510	260100	132651000	22 5832	7 9896	560	313600	175616600	23 6646	8 2024
511	261121	133432831	22 6053	7 9948	561	314721	176558431	23 6858	8 2083
512	262144	134217728	22 6274	8 0000	562	315844	177504330	23 7069	8 2142
513	263169	135005697	22 6495	8 0052	563	316969	178453597	23 7276	8 2201
514	264196	135796744	22 6716	8 0104	564	318096	179406144	23 7487	8 2260
515	265225	136590875	22 6936	8 0156	565	319225	180362125	23 7697	8 2319
516	266256	137388000	22 7156	8 0208	566	320356	181321496	23 7908	8 2378
517	267289	138188415	22 7376	8 0260	567	321489	182284463	23 8118	8 2437
518	268324	138991832	22 7596	8 0311	568	322624	183250432	23 8328	8 2496
519	269361	139798359	22 7816	8 0363	569	323761	184220009	23 8537	8 2555
520	270400	140608000	22 8035	8 0415	570	324900	185193000	23 8747	8 2614
521	271441	141420761	22 8254	8 0466	571	326041	186169411	23 8956	8 2673
522	272484	142236664	22 8473	8 0517	572	327184	187149242	23 9165	8 2732
523	273529	143055667	22 8692	8 0568	573	328329	188132517	23 9374	8 2791
524	274576	143877824	22 8910	8 0620	574	329476	189119224	23 9583	8 2850
525	275625	144703125	22 9129	8 0671	575	330625	190109375	23 9792	8 2909
526	276676	145531576	22 9347	8 0723	576	331776	191102976	24 0000	8 2968
527	277729	146363189	22 9565	8 0774	577	332929	192100033	24 0208	8 3027
528	278784	147197952	22 9783	8 0825	578	334084	193100552	24 0416	8 3086
529	279841	148035889	23 0000	8 0876	579	335241	194104539	24 0624	8 3145
530	280900	148877000	23 0217	8 0927	580	336400	195112900	24 0832	8 3204
531	281961	149721291	23 0434	8 0978	581	337561	196125641	24 1039	8 3263
532	283024	150568768	23 0651	8 1028	582	338724	197137362	24 1247	8 3322
533	284089	151419437	23 0868	8 1079	583	339889	198152287	24 1454	8 3381
534	285156	152273304	23 1084	8 1130	584	341056	199176704	24 1661	8 3440
535	286225	153130375	23 1301	8 1180	585	342225	200210625	24 1868	8 3499
536	287296	153990656	23 1517	8 1231	586	343396	201250156	24 2074	8 3558
537	288369	154854153	23 1733	8 1281	587	344569	202296203	24 2281	8 3617
538	289444	155720872	23 1948	8 1332	588	345744	203349742	24 2487	8 3676
539	290521	156590819	23 2164	8 1382	589	346921	204364669	24 2693	8 3735
540	291600	157464000	23 2379	8 1433	590	348100	205379000	24 2899	8 3794
541	292681	158340421	23 2594	8 1483	591	349281	206402501	24 3105	8 3853
542	293764	159220088	23 2809	8 1533	592	350464	207444688	24 3311	8 3912
543	294849	160103007	23 3024	8 1583	593	351649	208507857	24 3516	8 3971
544	295936	160989184	23 3238	8 1633	594	352836	209584584	24 3721	8 4030
545	297025	161878625	23 3452	8 1683	595	354025	210664487	24 3926	8 4089
546	298116	162771336	23 3666	8 1733	596	355216	211768736	24 4131	8 4148
547	299209	163667323	23 3880	8 1783	597	356409	212776173	24 4336	8 4207
548	300304	164566592	23 4094	8 1833	598	357604	213847192	24 4540	8 4266
549	301401	165469149	23 4307	8 1882	599	358801	214921799	24 4745	8 4325

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
600	360000	216000000	24 494	3 4243	650	422500	274525000	25 4951	8 6624
601	361201	21711801	24 5153	3 4390	651	423801	275834451	25 5147	8 6668
602	362404	218248208	24 5357	3 4437	652	425104	277167808	25 5343	8 6713
603	363609	219390627	24 5561	3 4484	653	426409	278445077	25 5539	8 6757
604	364816	220545364	24 5764	3 4530	654	427716	279726264	25 5734	8 6801
605	366025	221712525	24 5967	3 4577	655	429025	281011375	25 5930	8 6845
606	367236	222892516	24 6171	3 4623	656	430336	282300416	25 6125	8 6890
607	368444	224084543	24 6374	3 4670	657	431649	283593393	25 6320	8 6934
608	369654	225288712	24 6577	3 4716	658	432964	284890312	25 6515	8 6979
609	370864	226505020	24 6779	3 4763	659	434281	286191179	25 6710	8 7022
610	372100	227733600	24 6982	3 4909	660	435600	287496000	25 6905	8 7066
611	373321	228974131	24 7184	3 4956	661	436921	288804781	25 7099	8 7110
612	374544	229226928	24 7386	3 4902	662	438244	290117528	25 7294	8 7154
613	375769	230493397	24 7588	3 4948	663	439569	291434247	25 7488	8 7198
614	376996	231773544	24 7790	3 4994	664	440896	292754944	25 7682	8 7241
615	378225	233067375	24 7992	3 5040	665	442225	294079625	25 7876	8 7285
616	379456	234374896	24 8193	3 5086	666	443556	295408296	25 8070	8 7329
617	380689	235686113	24 8395	3 5132	667	444889	296740963	25 8265	8 7373
618	381924	236999924	24 8598	3 5178	668	446224	298077632	25 8457	8 7416
619	383161	238317661	24 8797	3 5224	669	447561	299418309	25 8650	8 7460
620	384400	239639600	24 8998	3 5270	670	448900	300763000	25 8844	8 7503
621	385641	240965861	24 9199	3 5316	671	450241	302111711	25 9037	8 7547
622	386884	242296424	24 9399	3 5362	672	451584	303464448	25 9230	8 7590
623	388129	243631367	24 9600	3 5408	673	452929	304821217	25 9422	8 7634
624	389376	244970624	24 9800	3 5453	674	454276	306182024	25 9615	8 7677
625	390625	246314325	25 0000	3 5499	675	455625	307546875	25 9808	8 7721
626	391876	247662476	25 0200	3 5544	676	456976	308915776	25 0000	8 7764
627	393129	249015081	25 0400	3 5590	677	458329	310288733	25 0192	8 7807
628	394384	250372124	25 0599	3 5635	678	459684	311665752	26 0384	8 7850
629	395641	251733601	25 0799	3 5681	679	461041	313046839	26 0576	8 7893
630	396900	253099600	25 0998	3 5726	680	462400	314432000	25 0768	8 7937
631	398161	254470131	25 1197	3 5772	681	463761	315821241	25 0960	8 7980
632	399424	255845184	25 1396	3 5817	682	465124	317214568	25 1151	8 8023
633	400689	257224757	25 1595	3 5862	683	466489	318611987	26 1343	8 8066
634	401956	258608840	25 1794	3 5907	684	467856	320013504	26 1534	8 8109
635	403225	260000000	25 1992	3 5952	685	469225	321419125	25 1725	8 8152
636	404496	261399216	25 2190	3 5997	686	470596	322828856	25 1916	8 8194
637	405769	262802489	25 2389	3 6043	687	471969	324242703	26 2107	8 8237
638	407044	264209920	25 2587	3 6088	688	473344	325656672	26 2298	8 8280
639	408321	265621511	25 2784	3 6132	689	474721	327070769	26 2488	8 8323
640	409600	267037200	25 2982	3 6177	690	476100	328485000	26 2679	8 8366
641	410881	268456981	25 3180	3 6222	691	477481	329903931	26 2869	8 8408
642	412164	269880824	25 3377	3 6267	692	478864	331327388	26 3059	8 8451
643	413449	271309727	25 3574	3 6312	693	480249	332755384	26 3249	8 8493
644	414736	272743680	25 3772	3 6357	694	481636	334187936	26 3439	8 8536
645	416025	274182685	25 3969	3 6401	695	483025	335625045	26 3629	8 8578
646	417316	275626744	25 4165	3 6446	696	484416	337066716	26 3818	8 8621
647	418609	277075857	25 4362	3 6490	697	485809	338512963	26 4008	8 8663
648	419904	278530024	25 4558	3 6535	698	487204	340063892	26 4197	8 8706
649	421201	279989249	25 4755	3 6579	699	488601	341520009	26 4386	8 8748

DORMAN, LONG & CO. LIMITED

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No	Square	Cube	Square Root	Cube Root	No	Square	Cube	Square Root	Cube Root
701	491401	343000001	700.99999	7.00000	706	500436	412700000	711.621	8.62000
702	493604	346000008	701.444	7.00000	707	502849	416000000	712.244	8.63000
703	495809	349000015	702.000	7.00000	708	505104	419300000	712.864	8.64000
704	498016	352000022	702.556	7.00000	709	507361	422600000	713.484	8.65000
705	500225	355000029	703.111	7.00000	710	509616	425900000	714.104	8.66000
706	502436	358000036	703.667	7.00000	711	511873	429200000	714.724	8.67000
707	504649	361000043	704.222	7.00000	712	514132	432500000	715.344	8.68000
708	506864	364000050	704.778	7.00000	713	516393	435800000	715.964	8.69000
709	509081	367000057	705.333	7.00000	714	518656	439100000	716.584	8.70000
710	511296	370000064	705.889	7.00000	715	520917	442400000	717.204	8.71000
711	513513	373000071	706.444	7.00000	716	523180	445700000	717.824	8.72000
712	515732	376000078	707.000	7.00000	717	525441	449000000	718.444	8.73000
713	517953	379000085	707.556	7.00000	718	527704	452300000	719.064	8.74000
714	520176	382000092	708.111	7.00000	719	529969	455600000	719.684	8.75000
715	522401	385000099	708.667	7.00000	720	532236	458900000	720.304	8.76000
716	524628	388000106	709.222	7.00000	721	534501	462200000	720.924	8.77000
717	526857	391000113	709.778	7.00000	722	536768	465500000	721.544	8.78000
718	529088	394000120	710.333	7.00000	723	539033	468800000	722.164	8.79000
719	531313	397000127	710.889	7.00000	724	541296	472100000	722.784	8.80000
720	533540	400000134	711.444	7.00000	725	543561	475400000	723.404	8.81000
721	535769	403000141	712.000	7.00000	726	545828	478700000	724.024	8.82000
722	538000	406000148	712.556	7.00000	727	548093	482000000	724.644	8.83000
723	540233	409000155	713.111	7.00000	728	550360	485300000	725.264	8.84000
724	542468	412000162	713.667	7.00000	729	552629	488600000	725.884	8.85000
725	544705	415000169	714.222	7.00000	730	554896	491900000	726.504	8.86000
726	546944	418000176	714.778	7.00000	731	557161	495200000	727.124	8.87000
727	549185	421000183	715.333	7.00000	732	559428	498500000	727.744	8.88000
728	551428	424000190	715.889	7.00000	733	561693	501800000	728.364	8.89000
729	553673	427000197	716.444	7.00000	734	563960	505100000	728.984	8.90000
730	555920	430000204	717.000	7.00000	735	566225	508400000	729.604	8.91000
731	558169	433000211	717.556	7.00000	736	568492	511700000	730.224	8.92000
732	560420	436000218	718.111	7.00000	737	570761	515000000	730.844	8.93000
733	562673	439000225	718.667	7.00000	738	573032	518300000	731.464	8.94000
734	564928	442000232	719.222	7.00000	739	575301	521600000	732.084	8.95000
735	567185	445000239	719.778	7.00000	740	577572	524900000	732.704	8.96000
736	569444	448000246	720.333	7.00000	741	579841	528200000	733.324	8.97000
737	571705	451000253	720.889	7.00000	742	582112	531500000	733.944	8.98000
738	573968	454000260	721.444	7.00000	743	584381	534800000	734.564	8.99000
739	576233	457000267	722.000	7.00000	744	586652	538100000	735.184	9.00000
740	578500	460000274	722.556	7.00000	745	588921	541400000	735.804	9.01000
741	580769	463000281	723.111	7.00000	746	591192	544700000	736.424	9.02000
742	583040	466000288	723.667	7.00000	747	593461	548000000	737.044	9.03000
743	585313	469000295	724.222	7.00000	748	595732	551300000	737.664	9.04000
744	587588	472000302	724.778	7.00000	749	598001	554600000	738.284	9.05000
745	589865	475000309	725.333	7.00000	750	600272	557900000	738.904	9.06000
746	592144	478000316	725.889	7.00000	751	602541	561200000	739.524	9.07000
747	594425	481000323	726.444	7.00000	752	604812	564500000	740.144	9.08000
748	596708	484000330	727.000	7.00000	753	607081	567800000	740.764	9.09000
749	598993	487000337	727.556	7.00000	754	609352	571100000	741.384	9.10000

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
800	640000	512000000	28 2243	9 2832	850	722500	614125000	29 1543	9 4727
801	641601	513922401	28 3015	9 2870	851	724201	616295051	29 1719	9 4764
802	643204	515849608	28 3196	9 2909	852	725904	618470208	29 1890	9 4801
803	644809	517781627	28 3373	9 2948	853	727609	620550477	29 2062	9 4838
804	646416	519718464	28 3549	9 2985	854	729316	622835854	29 2233	9 4875
805	648025	521660125	28 3725	9 3025	855	731025	625026375	29 2404	9 4912
806	649636	52360616	28 3901	9 3063	856	732736	627222016	29 2575	9 4949
807	651249	525557943	28 4077	9 3102	857	734449	629422793	29 2745	9 4986
808	652864	527514112	28 4253	9 3140	858	736164	631628712	29 2916	9 5023
809	654481	529475129	28 4429	9 3179	859	737881	633939779	29 3087	9 5060
810	656100	531441000	28 4605	9 3217	860	739500	636055000	29 3258	9 5097
811	657721	533411731	28 4781	9 3255	861	741321	638277381	29 3428	9 5134
812	659344	535387384	28 4956	9 3294	862	743044	640503924	29 3598	9 5171
813	660969	537367977	28 5132	9 3332	863	744769	642735647	29 3769	9 5207
814	662596	539353144	28 5307	9 3370	864	746496	644972544	29 3939	9 5244
815	664225	541343375	28 5482	9 3408	865	748225	647214525	29 4109	9 5281
816	665856	543338496	28 5657	9 3447	866	749956	649451896	29 4279	9 5317
817	667489	545338513	28 5832	9 3485	867	751689	651714363	29 4449	9 5354
818	669124	547343432	28 6007	9 3523	868	753424	653972032	29 4618	9 5391
819	670761	549353289	28 6182	9 3561	869	755161	656234909	29 4788	9 5427
820	672400	551368000	28 6356	9 3599	870	756900	658503000	29 4958	9 5464
821	674041	553387661	28 6531	9 3637	871	758641	660776311	29 5127	9 5501
822	675684	555412248	28 6705	9 3675	872	760384	663054848	29 5296	9 5537
823	677329	557441767	28 6880	9 3713	873	762129	665338617	29 5466	9 5574
824	678976	559476224	28 7054	9 3751	874	763876	667627624	29 5635	9 5610
825	680625	561515625	28 7228	9 3789	875	765625	669921875	29 5804	9 5647
826	682276	563559976	28 7402	9 3827	876	767376	672221376	29 5973	9 5683
827	683929	565599283	28 7576	9 3865	877	769129	674526133	29 6142	9 5719
828	685584	567643584	28 7750	9 3902	878	770884	676836152	29 6311	9 5756
829	687241	569692729	28 7924	9 3940	879	772641	679151439	29 6479	9 5792
830	688900	571737000	28 8097	9 3978	880	774400	681472000	29 6648	9 5828
831	690561	573786191	28 8271	9 4016	881	776161	683797841	29 6816	9 5865
832	692224	575839368	28 8444	9 4053	882	777924	686128968	29 6985	9 5901
833	693889	577896537	28 8617	9 4091	883	779689	688455387	29 7153	9 5937
834	695556	580000704	28 8791	9 4129	884	781456	690807104	29 7321	9 5973
835	697225	582102875	28 8964	9 4166	885	783225	693154125	29 7489	9 6010
836	698896	584204996	28 9137	9 4204	886	784996	695506456	29 7658	9 6046
837	700569	586307053	28 9310	9 4241	887	786769	697854103	29 7825	9 6082
838	702244	588409072	28 9482	9 4279	888	788544	700227072	29 7993	9 6118
839	703921	590510979	28 9655	9 4316	889	790321	702595369	29 8161	9 6154
840	705600	592612800	28 9828	9 4354	890	792100	704959000	29 8329	9 6190
841	707281	594714621	29 0000	9 4391	891	793881	707334771	29 8496	9 6226
842	708964	596816448	29 0172	9 4429	892	795664	709732228	29 8664	9 6262
843	710649	598917107	29 0345	9 4466	893	797449	712121957	29 8831	9 6298
844	712336	601017584	29 0517	9 4503	894	799236	714516984	29 8998	9 6334
845	714025	603117125	29 0689	9 4541	895	801025	716917375	29 9166	9 6370
846	715716	605216656	29 0861	9 4578	896	802816	719325136	29 9333	9 6406
847	717409	607316183	29 1033	9 4615	897	804609	721734273	29 9500	9 6442
848	719104	609415712	29 1204	9 4652	898	806404	724150792	29 9666	9 6477
849	720801	611515249	29 1376	9 4690	899	808201	726572699	29 9833	9 6513

DORMAN, LONG & CO. LIMITED.

SQUARES, CUBES, SQUARE ROOTS,
CUBE ROOTS, NOS. FROM 1 TO 1,000.

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
900	810000	729000000	900.000	9.6549	950	902500	857375000	950.222	9.8305
901	811801	731432701	901.007	9.6585	951	904401	860085351	951.230	9.8339
902	813604	733870808	902.013	9.6620	952	906304	862801408	952.238	9.8374
903	815409	736314327	903.020	9.6656	953	908209	865523177	953.246	9.8408
904	817216	738763264	904.026	9.6692	954	910116	868250664	954.254	9.8443
905	819025	741217625	905.033	9.6727	955	912025	870983875	955.262	9.8477
906	820836	743677316	906.039	9.6763	956	913936	873722816	956.270	9.8511
907	822649	746142643	907.046	9.6799	957	915849	876467493	957.278	9.8546
908	824464	748613312	908.053	9.6834	958	917764	879217912	958.286	9.8580
909	826281	751089429	909.059	9.6870	959	919681	881974079	959.294	9.8614
910	828100	753571000	910.066	9.6905	960	921600	884736000	960.302	9.8648
911	829921	756053031	911.073	9.6941	961	923521	887503681	961.310	9.8683
912	831744	758535052	912.079	9.6976	962	925444	890277128	962.318	9.8717
913	833569	761017073	913.086	9.7012	963	927369	893056347	963.326	9.8751
914	835396	763501944	914.093	9.7047	964	929296	895841344	964.334	9.8786
915	837225	766008075	915.100	9.7082	965	931225	898632125	965.342	9.8820
916	839056	768525296	916.107	9.7118	966	933156	901428696	966.350	9.8854
917	840889	771052513	917.114	9.7153	967	935089	904231063	967.358	9.8888
918	842724	773600632	918.121	9.7188	968	937024	907039924	968.366	9.8922
919	844561	776151553	919.128	9.7224	969	938961	909853209	969.374	9.8956
920	846400	778708000	920.135	9.7259	970	940900	912673000	970.382	9.8990
921	848241	781270081	921.142	9.7294	971	942841	915488611	971.390	9.9024
922	850084	783837744	922.149	9.7329	972	944784	918300048	972.398	9.9058
923	851929	786410467	923.156	9.7364	973	946729	9211167317	973.406	9.9092
924	853776	788988204	924.163	9.7400	974	948676	924010424	974.414	9.9126
925	855625	791571125	925.170	9.7435	975	950625	9268859375	975.422	9.9160
926	857476	794160276	926.177	9.7470	976	952576	929774176	976.430	9.9194
927	859329	796759783	927.184	9.7505	977	954529	932674333	977.438	9.9228
928	861184	799369784	928.191	9.7540	978	956484	935584356	978.446	9.9262
929	863041	801980329	929.198	9.7575	979	958441	938513739	979.454	9.9296
930	864900	804595000	930.205	9.7610	980	960400	941192600	980.462	9.9329
931	866761	807215491	931.212	9.7645	981	962361	944076141	981.470	9.9363
932	868624	809840824	932.219	9.7680	982	964324	946966168	982.478	9.9396
933	870489	812471125	933.226	9.7715	983	966289	949862087	983.486	9.9430
934	872356	815107504	934.233	9.7750	984	968256	952763904	984.494	9.9464
935	874225	8177490375	935.240	9.7785	985	970225	9556671625	985.502	9.9497
936	876096	820405856	936.247	9.7820	986	972196	958585256	986.510	9.9531
937	877969	823068953	937.254	9.7854	987	974169	961504083	987.518	9.9565
938	879844	825738672	938.261	9.7889	988	976144	964430272	988.526	9.9598
939	881721	8274135019	939.268	9.7924	989	978121	967361669	989.534	9.9632
940	883600	830088000	940.275	9.7959	990	980100	970239000	990.542	9.9666
941	885481	83277621	941.282	9.7993	991	982081	973242271	991.550	9.9699
942	887364	83546888	942.289	9.8028	992	984064	976191488	992.558	9.9733
943	889249	838166187	943.296	9.8063	993	986049	979146657	993.566	9.9766
944	891136	841232384	944.303	9.8097	994	988036	982107784	994.574	9.9800
945	893025	843908625	945.310	9.8132	995	990025	985074875	995.582	9.9833
946	894916	846590536	946.317	9.8167	996	992016	988047936	996.590	9.9866
947	896809	849278123	947.324	9.8201	997	994009	991026993	997.598	9.9900
948	898704	851971392	948.331	9.8236	998	996004	994011992	998.606	9.9933
949	900601	854670349	949.338	9.8270	999	998001	997002999	999.614	9.9967

DORMAN, LONG & CO. LIMITED.

LOGARITHMS OF NUMBERS FROM 0 TO 1,000.

No.	0	1	2	3	4	5	6	7	8	9
0	0000	0000	30103	47712	60206	69897	77815	84510	90309	95424
10	0000	00432	00960	01284	01703	02119	02531	02938	03342	03743
11	00439	00432	00960	01284	01703	02119	02531	02938	03342	03743
12	00712	00712	00712	00712	00712	00712	00712	00712	00712	00712
13	11394	11727	12057	12385	12710	13033	13354	13672	13988	14301
14	14513	14922	15229	15534	15836	16137	16435	16732	17026	17319
15	17609	17898	18184	18469	18752	19033	19312	19590	19866	20140
16	20412	20683	20951	21219	21484	21748	22011	22272	22531	22789
17	23045	23300	23553	23805	24055	24304	24551	24797	25042	25285
18	25527	25768	26007	26245	26482	26717	26951	27184	27416	27646
19	27875	28103	28330	28556	28780	29003	29226	29447	29667	29885
20	30103	30320	30535	30750	30963	31175	31387	31597	31806	32015
21	32222	32428	32634	32838	33041	33244	33445	33646	33846	34044
22	34242	34439	34635	34830	35025	35218	35411	35603	35793	35984
23	36173	36361	36549	36736	36922	37107	37291	37475	37658	37840
24	38021	38202	38382	38561	38739	38917	39094	39270	39445	39620
25	39794	39967	40140	40312	40483	40654	40824	40993	41162	41330
26	41497	41664	41830	41996	42160	42325	42488	42651	42813	42975
27	43136	43297	43457	43616	43775	43933	44091	44248	44404	44560
28	44716	44871	45025	45179	45332	45484	45637	45788	45939	46090
29	46240	46389	46538	46687	46835	46982	47129	47276	47422	47567
30	47712	47857	48001	48144	48287	48430	48572	48714	48855	48996
31	49136	49276	49415	49554	49693	49831	49969	50106	50243	50379
32	50515	50650	50786	50920	51054	51188	51322	51455	51587	51720
33	51851	51983	52114	52244	52375	52504	52634	52763	52892	53020
34	53148	53275	53403	53529	53656	53782	53908	54033	54158	54283
35	54407	54531	54654	54777	54900	55023	55145	55267	55388	55509
36	55630	55751	55871	55991	56110	56229	56348	56467	56585	56703
37	56820	56937	57054	57171	57287	57403	57519	57634	57749	57864
38	57978	58092	58206	58320	58433	58546	58659	58771	58883	58995
39	59106	59218	59329	59439	59550	59660	59770	59879	59988	60097
40	60206	60314	60423	60530	60638	60745	60853	60959	61066	61172
41	61278	61384	61490	61595	61700	61805	61909	62014	62118	62221
42	62325	62428	62531	62634	62737	62839	62941	63043	63144	63246
43	63347	63448	63549	63649	63749	63849	63949	64048	64147	64246
44	64345	64444	64542	64640	64738	64836	64933	65031	65128	65225
45	65321	65418	65514	65610	65706	65801	65896	65992	66087	66181
46	66276	66370	66464	66558	66652	66745	66839	66932	67025	67117
47	67210	67302	67394	67486	67578	67669	67761	67852	67943	68034
48	68124	68215	68305	68395	68485	68574	68664	68753	68842	68931
49	69020	69108	69197	69285	69373	69461	69548	69636	69723	69810
50	69897	69984	70070	70157	70243	70329	70415	70501	70586	70672
51	70757	70842	70927	71012	71096	71181	71265	71349	71433	71517
52	71600	71684	71767	71850	71933	72016	72099	72181	72263	72346
53	72428	72509	72591	72673	72754	72835	72916	72997	73078	73159
54	73239	73320	73400	73480	73560	73640	73719	73799	73878	73957

DORMAN, LONG & CO. LIMITED.

LOGARITHMS OF NUMBERS FROM 0 TO 1,000.

No.	0	1	2	3	4	5	6	7	8	9
55	7409	7415	7419	7423	7427	7431	7435	7439	7443	7447
56	7451	7456	7460	7464	7468	7472	7476	7480	7484	7488
57	7492	7496	7500	7504	7508	7512	7516	7520	7524	7528
58	7532	7536	7540	7544	7548	7552	7556	7560	7564	7568
59	7572	7576	7580	7584	7588	7592	7596	7600	7604	7608
60	7612	7616	7620	7624	7628	7632	7636	7640	7644	7648
61	7652	7656	7660	7664	7668	7672	7676	7680	7684	7688
62	7692	7696	7700	7704	7708	7712	7716	7720	7724	7728
63	7732	7736	7740	7744	7748	7752	7756	7760	7764	7768
64	7772	7776	7780	7784	7788	7792	7796	7800	7804	7808
65	7812	7816	7820	7824	7828	7832	7836	7840	7844	7848
66	7852	7856	7860	7864	7868	7872	7876	7880	7884	7888
67	7892	7896	7900	7904	7908	7912	7916	7920	7924	7928
68	7932	7936	7940	7944	7948	7952	7956	7960	7964	7968
69	7972	7976	7980	7984	7988	7992	7996	8000	8004	8008
70	8012	8016	8020	8024	8028	8032	8036	8040	8044	8048
71	8052	8056	8060	8064	8068	8072	8076	8080	8084	8088
72	8092	8096	8100	8104	8108	8112	8116	8120	8124	8128
73	8132	8136	8140	8144	8148	8152	8156	8160	8164	8168
74	8172	8176	8180	8184	8188	8192	8196	8200	8204	8208
75	8212	8216	8220	8224	8228	8232	8236	8240	8244	8248
76	8252	8256	8260	8264	8268	8272	8276	8280	8284	8288
77	8292	8296	8300	8304	8308	8312	8316	8320	8324	8328
78	8332	8336	8340	8344	8348	8352	8356	8360	8364	8368
79	8372	8376	8380	8384	8388	8392	8396	8400	8404	8408
80	8412	8416	8420	8424	8428	8432	8436	8440	8444	8448
81	8452	8456	8460	8464	8468	8472	8476	8480	8484	8488
82	8492	8496	8500	8504	8508	8512	8516	8520	8524	8528
83	8532	8536	8540	8544	8548	8552	8556	8560	8564	8568
84	8572	8576	8580	8584	8588	8592	8596	8600	8604	8608
85	8612	8616	8620	8624	8628	8632	8636	8640	8644	8648
86	8652	8656	8660	8664	8668	8672	8676	8680	8684	8688
87	8692	8696	8700	8704	8708	8712	8716	8720	8724	8728
88	8732	8736	8740	8744	8748	8752	8756	8760	8764	8768
89	8772	8776	8780	8784	8788	8792	8796	8800	8804	8808
90	8812	8816	8820	8824	8828	8832	8836	8840	8844	8848
91	8852	8856	8860	8864	8868	8872	8876	8880	8884	8888
92	8892	8896	8900	8904	8908	8912	8916	8920	8924	8928
93	8932	8936	8940	8944	8948	8952	8956	8960	8964	8968
94	8972	8976	8980	8984	8988	8992	8996	9000	9004	9008
95	9012	9016	9020	9024	9028	9032	9036	9040	9044	9048
96	9052	9056	9060	9064	9068	9072	9076	9080	9084	9088
97	9092	9096	9100	9104	9108	9112	9116	9120	9124	9128
98	9132	9136	9140	9144	9148	9152	9156	9160	9164	9168
99	9172	9176	9180	9184	9188	9192	9196	9200	9204	9208

DORMAN, LONG & CO. LIMITED.

Degrees		TANGENT							
		0	10	20	30	40	50	60	
0			00291	00582	00873	01164	01455	01746	89
1	01746	02036	02328	02619	02910	03201	03492	03783	88
2	03492	03783	04075	04366	04658	04949	05241	05533	87
3	05241	05533	05824	06116	06408	06700	06993	07285	86
4	06993	07285	07578	07870	08163	08456	08749	09042	85
5	08749	09042	09335	09629	09923	10216	10510	10804	84
6	10804	11099	11394	11688	11983	12278	12573	12868	83
7	12573	12868	13165	13461	13758	14054	14351	14648	82
8	14351	14648	14945	15243	15540	15838	16136	16435	81
9	16136	16435	16734	17033	17333	17633	17933	18233	80
10	18233	18533	18835	19136	19432	19733	20033	20333	79
11	20333	20633	20933	21233	21533	21833	22133	22433	78
12	22433	22733	23033	23333	23633	23933	24233	24533	77
13	24533	24833	25133	25433	25733	26033	26333	26633	76
14	26633	26933	27233	27533	27833	28133	28433	28733	75
15	28733	29033	29333	29633	29933	30233	30533	30833	74
16	30833	31133	31433	31733	32033	32333	32633	32933	73
17	32933	33233	33533	33833	34133	34433	34733	35033	72
18	35033	35333	35633	35933	36233	36533	36833	37133	71
19	37133	37433	37733	38033	38333	38633	38933	39233	70
20	39233	39533	39833	40133	40433	40733	41033	41333	69
21	41333	41633	41933	42233	42533	42833	43133	43433	68
22	43433	43733	44033	44333	44633	44933	45233	45533	67
23	45533	45833	46133	46433	46733	47033	47333	47633	66
24	47633	47933	48233	48533	48833	49133	49433	49733	65
25	49733	50033	50333	50633	50933	51233	51533	51833	64
26	51833	52133	52433	52733	53033	53333	53633	53933	63
27	53933	54233	54533	54833	55133	55433	55733	56033	62
28	56033	56333	56633	56933	57233	57533	57833	58133	61
29	58133	58433	58733	59033	59333	59633	59933	60233	60
30	60233	60533	60833	61133	61433	61733	62033	62333	59
31	62333	62633	62933	63233	63533	63833	64133	64433	58
32	64433	64733	65033	65333	65633	65933	66233	66533	57
33	66533	66833	67133	67433	67733	68033	68333	68633	56
34	68633	68933	69233	69533	69833	70133	70433	70733	55
35	70733	71033	71333	71633	71933	72233	72533	72833	54
36	72833	73133	73433	73733	74033	74333	74633	74933	53
37	74933	75233	75533	75833	76133	76433	76733	77033	52
38	77033	77333	77633	77933	78233	78533	78833	79133	51
39	79133	79433	79733	80033	80333	80633	80933	81233	50
40	81233	81533	81833	82133	82433	82733	83033	83333	49
41	83333	83633	83933	84233	84533	84833	85133	85433	48
42	85433	85733	86033	86333	86633	86933	87233	87533	47
43	87533	87833	88133	88433	88733	89033	89333	89633	46
44	89633	89933	90233	90533	90833	91133	91433	91733	45
		60	50	40	30	20	10	0	Degrees
COTANGENT									

DORMAN, LONG & CO. LIMITED.

LBS. RISING BY 7, EXPRESSED IN CWTs.,
QRS. & LBS. AND IN DECIMALS OF A TON.

Lbs.	c.	q.	lbs.	Ton	Lbs.	c.	q.	lbs.	Ton	Lbs.	c.	q.	lbs.	Ton
7			7	003125	336	3	0	0	15	672	6	0	0	3
14			14	00625	343	3	0	7	153125	679	6	0	7	303125
21			21	009375	350	3	0	14	15625	686	6	0	14	30625
28		1	0	0125	357	3	0	21	159375	693	6	0	21	309375
35		1	7	015625	364	3	1	0	1625	700	6	1	0	3125
42		1	14	01875	371	3	1	7	165625	707	6	1	7	315625
49		1	21	021875	378	3	1	14	16875	714	6	1	14	31875
56		2	0	025	385	3	1	21	171875	721	6	1	21	321875
63		2	7	028125	392	3	2	0	175	728	6	2	0	325
70		2	14	03125	399	3	2	7	178125	735	6	2	7	328125
77		2	21	034375	406	3	2	14	18125	742	6	2	14	33125
84		3	0	0375	413	3	2	21	184375	749	6	2	21	334375
91		3	7	040625	420	3	3	0	1875	756	6	3	0	3375
98		3	14	04375	427	3	3	7	190625	763	6	3	7	340625
105		3	21	046875	434	3	3	14	19375	770	6	3	14	34375
					441	3	3	21	196875	777	6	3	21	346875
112		1	0	0	448	4	0	0	2	784	7	0	0	35
119		1	7	053125	455	4	0	7	203125	791	7	0	7	353125
126		1	14	05625	462	4	0	14	20625	798	7	0	14	35625
133		1	21	059375	469	4	0	21	209375	805	7	0	21	359375
140		1	28	0625	476	4	1	0	2125	812	7	1	0	3625
147		1	25	065625	483	4	1	7	215625	819	7	1	7	365625
154		1	14	06875	490	4	1	14	21875	826	7	1	14	36875
161		1	21	071875	497	4	1	21	221875	833	7	1	21	371875
168		1	28	075	504	4	2	0	225	840	7	2	0	375
175		1	25	078125	511	4	2	7	228125	847	7	2	7	378125
182		1	22	08125	518	4	2	14	23125	854	7	2	14	38125
189		1	29	084375	525	4	2	21	234375	861	7	2	21	384375
196		1	36	0875	532	4	3	0	2375	868	7	3	0	3875
203		1	33	090625	539	4	3	7	240625	875	7	3	7	390625
210		1	30	09375	546	4	3	14	24375	882	7	3	14	39375
217		1	37	096875	553	4	3	21	246875	889	7	3	21	396875
224		2	0	0	560	5	0	0	25	896	8	0	0	4
231		2	0	7	567	5	0	7	253125	903	8	0	7	403125
238		2	0	14	574	5	0	14	25625	910	8	0	14	40625
245		2	0	21	581	5	0	21	259375	917	8	0	21	409375
252		2	1	0	588	5	1	0	2625	924	8	1	0	4125
259		2	1	7	595	5	1	7	265625	931	8	1	7	415625
266		2	1	14	602	5	1	14	26875	938	8	1	14	41875
273		2	1	21	609	5	1	21	271875	945	8	1	21	421875
280		2	2	0	616	5	2	0	275	952	8	2	0	425
287		2	2	7	623	5	2	7	278125	959	8	2	7	428125
294		2	2	14	630	5	2	14	28125	966	8	2	14	43125
301		2	2	21	637	5	2	21	284375	973	8	2	21	434375
308		2	3	0	644	5	3	0	2875	980	8	3	0	4375
315		2	3	7	651	5	3	7	290625	987	8	3	7	440625
322		2	3	14	658	5	3	14	29375	994	8	3	14	44375
329		2	3	21	665	5	3	21	296875	1001	8	3	21	446875

LBS. RISING BY 1 EXPRESSED IN CWTs
QTS & LBS AND IN DECIMALS OF A TON.

DORMAN, LONG & CO. LIMITED.

LBS. RISING BY 7, EXPRESSED IN CWTs.,
QRS. & LBS. AND IN DECIMALS OF A TON—

CONTINUED

Lbs.	c. q. lbs.	Ton	Lbs.	c. q. lbs.	Ton
2016	18 0 0	9	2128	18 0 8	95
2023	18 0 7	903125	2135	19 0 7	953125
2030	18 0 14	90625	2142	19 0 14	95625
2037	18 0 21	909375	2149	19 0 21	959375
2044	18 1 0	9125	2156	19 1 0	9625
2051	18 1 7	915625	2163	19 1 7	965625
2058	18 1 14	91875	2170	19 1 14	96875
2065	18 1 21	921875	2177	19 1 21	971875
2072	18 2 0	925	2184	19 2 0	975
2079	18 2 7	928125	2191	19 2 7	978125
2086	18 2 14	93125	2198	19 2 14	98125
2093	18 2 21	934375	2205	19 2 21	984375
2100	18 3 0	9375	2212	19 3 0	9875
2107	18 3 7	940625	2219	19 3 7	990625
2114	18 3 14	94375	2226	19 3 14	99375
2121	18 3 21	946875	2233	19 3 21	996875
			2240	20 0 0	1

CONVERSION TABLE TONS INTO POUNDS.

Tons	Pounds	Tons	Pounds	Tons	Pounds	Tons	Pounds
1	2.240	26	58.240	51	114.240	76	170.240
2	4.480	27	60.480	52	116.480	77	172.480
3	6.720	28	62.720	53	118.720	78	174.720
4	8.960	29	64.960	54	120.960	79	176.960
5	11.200	30	67.200	55	123.200	80	179.200
6	13.440	31	69.440	56	125.440	81	181.440
7	15.680	32	71.680	57	127.680	82	183.680
8	17.920	33	73.920	58	129.920	83	185.920
9	20.160	34	76.160	59	132.160	84	188.160
10	22.400	35	78.400	60	134.400	85	190.400
11	24.640	36	80.640	61	136.640	86	192.640
12	26.880	37	82.880	62	138.880	87	194.880
13	29.120	38	85.120	63	141.120	88	197.120
14	31.360	39	87.360	64	143.360	89	199.360
15	33.600	40	89.600	65	145.600	90	201.600
16	35.840	41	91.840	66	147.840	91	203.840
17	38.080	42	94.080	67	150.080	92	206.080
18	40.320	43	96.320	68	152.320	93	208.320
19	42.560	44	98.560	69	154.560	94	210.560
20	44.800	45	100.800	70	156.800	95	212.800
21	47.040	46	103.040	71	159.040	96	215.040
22	49.280	47	105.280	72	161.280	97	217.280
23	51.520	48	107.520	73	163.520	98	219.520
24	53.760	49	109.760	74	165.760	99	221.760
25	56.000	50	112.000	75	168.000	100	224.000

DORMAN, LONG & CO. LIMITED.

APPROXIMATE LIVE LOAD ON FLOORS.

Crowd of People	-	-	-	84 to 112 lbs. per sq. ft.
Floors of Dwellings and Offices	-	56 to 112	" "	" "
Floors of Public Halls, Churches, Theatres, &c.	-	-	-	100 to 160 " " "
Floors of Stores, Warehouses, &c.	-	100 to 300	" "	" "
Floors of Workshops carrying heavy machinery	-	-	-	200 to 400 " " "

APPROXIMATE WEIGHT, IN LBS. PER CUBIC
FOOT, OF VARIOUS SUBSTANCES.

Barley	-	-	-	-	-	-	38
Wheat	-	-	-	-	-	-	48
Coal, ordinary, broken, loose	-	-	-	-	-	-	56
Coke	-	-	-	-	-	-	46
Concrete	-	-	-	-	-	112 to	130
Cast Iron	-	-	-	-	-	-	450
Lead	-	-	-	-	-	-	712
Masonry, granite	-	-	-	-	-	-	160
" sandstone	-	-	-	-	-	-	140
Brickwork	-	-	-	-	-	-	112
Steel, rolled	-	-	-	-	-	-	489·6
Glass	-	-	-	-	-	160 to	190
Water, fresh	-	-	-	-	-	-	62·28

WEIGHT AND BULK OF WATER.

Fresh Water :- 1 cubic foot	=	6·228 gallons.
(at 62° Fahr) 1 gallon	=	10lbs.
1 gallon	=	·161 cubic foot.
1 ton	=	36 cubic feet.
1 ton	=	224 gallons.

The weight of fresh water is to that of sea water as 1 is to 1·026.

DORMAN, LONG & CO. LIMITED.

WEIGHTS AND MEASURES.

LINEAR MEASURE.

Inches	Feet	Yards	Poles	Furlongs	Mile
1	0.0833	0.0278	0.0050505	0.00012626	0.00001578
12	1	0.3333	0.0666061	0.0151515	0.0018939
36	3	1	0.1818182	0.0454545	0.0056613
144	12	4	0.7272727	0.1818182	0.0226696
1728	144	48	9.0909091	2.2727273	0.2745538
63360	5280	1760	320	10	1

SURVEYING MEASURE (LINEAL).

Inches	Links	Feet	Yards	Chains	Mile
1	0.126	0.0833	0.0278	0.00126	0.0000158
7.92	1	0.66	0.22	0.01	0.000125
12	1.015	1	0.333	0.01515	0.000189
36	4.545	3	1	0.04545	0.000568
792	100	66	22	1	0.0125
63360	8000	5280	1760	80	1

CUBIC MEASURE.

Inches	Feet	Yards
1	0.0005787	0.00002143
1728	1	0.03704
46656	27	1

DORMAN, LONG & CO. LIMITED.

WEIGHTS AND MEASURES.

SQUARE MEASURE.

Square Inches	Square Feet	Square Yards	Square Poles	Roods	Acres	Square Mile
1	00004	00072				
144	1	00111	003673			
1296	9	1	033050	000026		
272 25	30 25	1	004	005 1/2		
10890	1210	40	1		0000006	
43560	4840	160	4		0000012	
	3037600	102400	2560		640	1

MEASURE OF CAPACITY.

Pints	Quarts	Gallons	Pecks	Bushels	Quarters	Cubic Inches
1	2	4	8	015625	00165195	34 653
2	1	2	4	03125	00330390	69 306
8	4	1	2	1	015625	277 485
16	8	2	1	25	03125	554 970
64	32	8	4	1	125	2219 704
512	256	64	32	8	1	17777 632

AVOIRDUPOIS WEIGHT.

Grains	Drams	Ounces	Pounds	Hundred-weights	Gross Ton
1	03657	002286	000143	00000128	0000000637
27 34375	1	0625	003906	00003438	000001744
437 5	16	1	0625	00055804	00002790
7000	256	16	1	0089286	0004464
784000	28672	1792	112	1	05
15680000	573440	35840	2240	20	1

DORMAN, LONG & CO. LIMITED.

METRIC MEASURES.

LINEAR MEASURE.

Millimetres	Centimetres	Decimetres	Metres	Dekametres	Hectometres	Kilometre
1	0.01	0.1	1	10	100	1000
10	0.1	1	10	100	1000	10000
100	1	10	100	1000	10000	100000
1000	10	100	1000	10000	100000	1000000
10000	100	1000	10000	100000	1000000	10000000
100000	1000	10000	100000	1000000	10000000	100000000
1000000	10000	100000	1000000	10000000	100000000	1000000000

SQUARE MEASURE.

Square Centimetres	Square Decimetres	Square Metres	Ares or Square Decimetres	Hectare or Square Hectometre
1	0.01	0.0001	0.0001	0.000001
100	0.1	0.01	0.001	0.00001
10000	1	1	0.01	0.0001
1000000	100	100	1	0.01
100000000	10000	10000	100	1

CUBIC MEASURE.

Cubic Centimetres	Cubic Decimetres	Cubic Metre
1	0.001	0.000001
1000	1	0.001
1000000	1000	1

DORMAN, LONG & CO. LIMITED.

METRIC MEASURES.

MEASURES OF CAPACITY.

Millilitres	Centilitres	Decilitres	Litres	Dekalitres	Hectolitres	Kilolitres
1	1	.01	.001	.0001	.00001	.000001
10	10	.1	.01	.001	.0001	.00001
100	100	1	.1	.01	.001	.0001
1000	1000	10	1	.1	.01	.001
10000	10000	100	10	1	.1	.01
100000	100000	1000	100	10	1	.1
1000000	1000000	10000	1000	100	10	1

WEIGHTS.

Milli-grammes	Centi-grammes	Deci-grammes	Grammes	Deka-grammes	Hecto-grammes	Kilo-gramme
1	.1	.01	.001	.0001	.00001	.000001
10	1	.1	.01	.001	.0001	.00001
100	10	1	.1	.01	.001	.0001
1000	100	10	1	.1	.01	.001
10000	1000	100	10	1	.1	.01
100000	10000	1000	100	10	1	.1
1000000	100000	10000	1000	100	10	1

DORMAN, LONG & CO. LIMITED.

METRICAL EQUIVALENTS OF BRITISH UNITS.

LINEAR MEASURE.

British Units	Metrical Equivalents	Metrical Units	British Equivalents
1 inch	2.5400001 centimetres	1 millimetre	0.03937 inches
1 foot	0.3048006 metres	1 centimetre	0.03937 inches
1 yard	0.9144018 metres	1 metre	39.37009 inches
1 fathom	1.8288036 metres	1 kilometre	0.621371 miles
1 mile	1.609347 kilometres	1 hectometre	2.485481 miles
1 furlong	201.1684 metres	1 decimetre	0.3937009 inches
1 mile	1609.347 metres	1 centimetre	0.3937009 inches

SQUARE MEASURE.

British Units	Metrical Equivalents	Metrical Units	British Equivalents
1 sq. inch	6.4516 sq. centimetres	1 sq. centimetre	1550003 sq. inch
1 foot	0.3048006 metres	1 metre	1.0936133 fathoms
1 yard	0.9144018 metres	1 hectometre	2.485481 miles
1 acre	4046.8564224 sq. metres	1 hectare	2.47105 acres
1 sq. mile	259.0322365 sq. kilometres	1 sq. kilometre	0.3861021 sq. mile

CUBIC MEASURE.

British Units	Metrical Equivalents	Metrical Units	British Equivalents
1 cubic inch	16.387064 cubic centimetres	1 cubic centimetre	0.0000160185 cubic inch
1 foot	0.3048006 metres	1 metre	3.28084 feet
1 yard	0.9144018 metres	1 kilometre	0.621371 miles

CAPACITY.

British Units	Metrical Equivalents	Metrical Units	British Equivalents
1 cubic inch	16.387064 cubic centimetres	1 millilitre	0.0000160185 cubic inch
1 foot	0.3048006 metres	1 centilitre	0.000160185 cubic inch
1 yard	0.9144018 metres	1 litre	0.00160185 cubic inch
1 quart	0.946353 litres	1 hectolitre	2.47105 acres
1 gallon	4.54609 litres	1 decalitre	2.47105 acres
1 bushel	3.63687 litres	1 hectolitre	2.47105 acres
1	3.63687 litres	1 hectolitre	2.47105 acres

DORMAN, LONG & CO. LIMITED.

METRICAL EQUIVALENTS OF BRITISH UNITS.
WEIGHT.

British Units	Metrical Equivalents	Metrical Units	British Equivalents
Avoirdupois		Avoirdupois	
1 grain	0.064 79891 milligrammes	1 kilogramme	35.273 96 grains
1 ounce	0.028 349 523 kilograms	1 centigramme	0.154 323 grains
1 pound	0.453 592 37 kilograms	1 decigramme	1.543 23 grains
1 stone	6.350 293 48 kilograms	1 milligramme	0.015 432 3 grains
1 cwt.	50.802 345 44 kilograms	1 microgramme	0.000 154 323 grains
1 ton	1016.046 908 88 kilograms	1 quintal	113.454 35 pounds
1 ton	1016.046 908 88 kilograms	1 quintal	113.454 35 pounds

MISCELLANEOUS COMPOUND MEASURES

British Units	Metrical Equivalents	Metrical Units	British Equivalents
1 foot per second	0.304 8 metres per second	1 metre per second	3.280 8 feet per second
1 foot per minute	0.050 8 metres per minute	1 metre per minute	3.280 8 feet per minute
1 cubic foot	0.028 316 846 6 litres	1 kilogramme per litre	0.035 233 541 pounds per litre
1 gallon per foot	0.000 136 026 72 kilograms per metre	1 kilogramme per metre	0.000 136 026 72 kilograms per metre
1 pound per square foot	0.045 359 2 kilograms per square metre	1 kilogramme per square metre	22.046 226 12 pounds per square foot
1 pound per square inch	0.070 306 9 kilograms per square metre	1 kilogramme per square metre	14.593 902 94 pounds per square inch
1 pound per cubic foot	0.016 018 46 kilograms per cubic metre	1 kilogramme per cubic metre	16.018 463 37 pounds per cubic foot
1 pound per cubic yard	0.001 198 416 kilograms per cubic metre	1 kilogramme per cubic metre	0.001 198 416 kilograms per cubic metre
1 pound per gallon	0.000 136 026 72 kilograms per litre	1 kilogramme per litre	0.000 136 026 72 kilograms per litre

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS IN MILLIMETRES

OF INCHES AND FRACTIONS OF AN INCH ADVANCING BY 32nds.

Inches	0	1	2	3	4	5
0		25·400	50·799	76·199	101·598	126·993
$\frac{1}{16}$	794	26·193	51·593	76·992	102·392	127·791
$\frac{1}{8}$	1·537	26·987	52·387	77·786	103·186	128·585
$\frac{3}{16}$	2·381	27·781	53·180	78·580	103·979	129·379
$\frac{1}{4}$	3·175	28·574	53·974	79·374	104·773	130·173
$\frac{5}{16}$	3·969	29·368	54·768	80·167	105·567	130·966
$\frac{3}{8}$	4·762	30·162	55·561	80·961	105·361	131·760
$\frac{7}{16}$	5·556	30·956	56·355	81·755	107·154	132·554
$\frac{1}{2}$	6·350	31·749	57·149	82·549	107·948	133·348
$\frac{9}{16}$	7·144	32·543	57·943	83·342	108·742	134·141
$\frac{5}{8}$	7·937	33·337	58·736	84·136	109·536	134·935
$\frac{11}{16}$	8·731	34·131	59·530	84·930	110·329	135·729
$\frac{3}{4}$	9·525	34·924	60·324	85·723	111·123	136·523
$\frac{13}{16}$	10·319	35·718	61·118	86·517	111·917	137·316
$\frac{7}{8}$	11·112	36·512	61·911	87·311	112·710	138·110
$\frac{15}{16}$	11·906	37·306	62·705	88·105	113·504	138·904
$1\frac{1}{16}$	12·700	38·099	63·499	88·898	114·298	139·697
$1\frac{1}{8}$	13·494	38·893	64·293	89·692	115·092	140·491
$1\frac{3}{16}$	14·287	39·687	65·086	90·486	115·885	141·285
$1\frac{1}{2}$	15·081	40·481	65·880	91·280	116·679	142·079
$1\frac{5}{8}$	15·875	41·274	66·674	92·073	117·473	142·872
$1\frac{3}{4}$	16·668	42·068	67·468	92·867	118·267	143·666
$1\frac{7}{8}$	17·462	42·862	68·261	93·661	119·060	144·460
$2\frac{1}{16}$	18·256	43·655	69·055	94·455	119·854	145·254
$2\frac{1}{8}$	19·050	44·449	69·849	95·248	120·648	146·047
$2\frac{3}{16}$	19·843	45·243	70·642	96·042	121·442	146·841
$2\frac{1}{4}$	20·637	46·037	71·436	96·836	122·235	147·635
$2\frac{5}{16}$	21·431	46·830	72·230	97·629	123·029	148·429
$2\frac{3}{8}$	22·225	47·624	73·024	98·423	123·823	149·222
$2\frac{7}{16}$	23·018	48·418	73·817	99·217	124·616	150·016
$2\frac{1}{2}$	23·812	49·212	74·611	100·011	125·410	150·810
$2\frac{9}{16}$	24·606	50·005	75·405	100·804	126·204	151·604

12 Inches = 304·794 Millimetres.

TIGHE, M. J. N., LONGO, R. & COLE, E. J. 1977

EQUIVALENTS IN MILLIMETRES

OF INCHES AND FRACTIONS OF AN INCH ADVANCING BY 1/16 IN.

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF MILLIMETRES IN INCHES.

Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches
1	0.039	51	2.008	101	4.016	151	5.945	201	7.913
2	0.078	52	2.047	102	4.031	152	5.984	202	7.953
3	0.118	53	2.087	103	4.065	153	6.024	203	7.992
4	0.157	54	2.126	104	4.096	154	6.063	204	8.032
5	0.197	55	2.165	105	4.134	155	6.102	205	8.071
6	0.236	56	2.205	106	4.173	156	6.142	206	8.110
7	0.276	57	2.244	107	4.213	157	6.181	207	8.150
8	0.315	58	2.283	108	4.252	158	6.221	208	8.189
9	0.354	59	2.322	109	4.291	159	6.260	209	8.228
10	0.394	60	2.362	110	4.331	160	6.299	210	8.268
11	0.433	61	2.401	111	4.370	161	6.338	211	8.307
12	0.473	62	2.441	112	4.409	162	6.378	212	8.347
13	0.512	63	2.480	113	4.449	163	6.417	213	8.386
14	0.552	64	2.520	114	4.488	164	6.457	214	8.425
15	0.591	65	2.559	115	4.528	165	6.496	215	8.465
16	0.630	66	2.598	116	4.567	166	6.535	216	8.504
17	0.669	67	2.638	117	4.606	167	6.575	217	8.543
18	0.709	68	2.677	118	4.646	168	6.614	218	8.583
19	0.748	69	2.717	119	4.685	169	6.654	219	8.622
20	0.787	70	2.756	120	4.724	170	6.693	220	8.661
21	0.827	71	2.795	121	4.764	171	6.732	221	8.701
22	0.866	72	2.835	122	4.803	172	6.772	222	8.740
23	0.906	73	2.874	123	4.843	173	6.811	223	8.780
24	0.945	74	2.914	124	4.882	174	6.850	224	8.819
25	0.984	75	2.953	125	4.921	175	6.890	225	8.858
26	1.024	76	2.992	126	4.961	176	6.929	226	8.898
27	1.063	77	3.032	127	5.000	177	6.969	227	8.937
28	1.102	78	3.071	128	5.039	178	7.008	228	8.976
29	1.142	79	3.110	129	5.079	179	7.047	229	9.016
30	1.181	80	3.150	130	5.118	180	7.087	230	9.055
31	1.220	81	3.189	131	5.158	181	7.126	231	9.095
32	1.260	82	3.228	132	5.197	182	7.165	232	9.134
33	1.299	83	3.268	133	5.236	183	7.205	233	9.173
34	1.339	84	3.307	134	5.276	184	7.244	234	9.213
35	1.378	85	3.346	135	5.315	185	7.284	235	9.252
36	1.417	86	3.386	136	5.354	186	7.323	236	9.291
37	1.457	87	3.425	137	5.394	187	7.362	237	9.331
38	1.496	88	3.465	138	5.433	188	7.402	238	9.370
39	1.535	89	3.504	139	5.472	189	7.441	239	9.410
40	1.575	90	3.543	140	5.512	190	7.480	240	9.449
41	1.614	91	3.583	141	5.551	191	7.520	241	9.488
42	1.654	92	3.622	142	5.591	192	7.559	242	9.528
43	1.693	93	3.661	143	5.630	193	7.598	243	9.567
44	1.732	94	3.701	144	5.669	194	7.638	244	9.606
45	1.772	95	3.740	145	5.709	195	7.677	245	9.646
46	1.811	96	3.780	146	5.748	196	7.717	246	9.685
47	1.850	97	3.819	147	5.787	197	7.756	247	9.724
48	1.890	98	3.858	148	5.827	198	7.795	248	9.764
49	1.929	99	3.898	149	5.866	199	7.835	249	9.803
50	1.969	100	3.937	150	5.906	200	7.874	250	9.843

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF MILLIMETRES IN INCHES.

Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches
251	9.884	301	11.850	351	13.816	401	15.782	451	17.748
252	9.901	302	11.866	352	13.832	402	15.798	452	17.764
253	9.917	303	11.882	353	13.848	403	15.814	453	17.780
254	10.000	304	11.969	354	13.937	404	15.896	454	17.864
255	10.016	305	12.000	355	13.977	405	15.940	455	17.904
256	10.079	306	12.047	356	14.016	406	15.984	456	17.953
257	10.112	307	12.107	357	14.055	407	16.024	457	17.992
258	10.150	308	12.130	358	14.077	408	16.063	458	18.032
259	10.167	309	12.165	359	14.104	409	16.103	459	18.071
260	10.236	310	12.200	360	14.177	410	16.144	460	18.110
261	10.278	311	12.244	361	14.215	411	16.181	461	18.150
262	10.316	312	12.284	362	14.258	412	16.221	462	18.189
263	10.354	313	12.323	363	14.299	413	16.260	463	18.229
264	10.394	314	12.362	364	14.337	414	16.299	464	18.268
265	10.453	315	12.402	365	14.377	415	16.339	465	18.307
266	10.475	316	12.441	366	14.410	416	16.378	466	18.347
267	10.515	317	12.480	367	14.449	417	16.417	467	18.386
268	10.561	318	12.520	368	14.488	418	16.457	468	18.425
269	10.591	319	12.559	369	14.528	419	16.496	469	18.465
270	10.630	320	12.599	370	14.567	420	16.536	470	18.504
271	10.669	321	12.638	371	14.606	421	16.575	471	18.544
272	10.709	322	12.677	372	14.646	422	16.614	472	18.583
273	10.748	323	12.717	373	14.685	423	16.654	473	18.622
274	10.781	324	12.756	374	14.725	424	16.693	474	18.662
275	10.827	325	12.795	375	14.764	425	16.732	475	18.701
276	10.866	326	12.835	376	14.804	426	16.772	476	18.740
277	10.906	327	12.874	377	14.843	427	16.811	477	18.780
278	10.945	328	12.914	378	14.882	428	16.851	478	18.819
279	10.994	329	12.953	379	14.921	429	16.890	479	18.858
280	11.034	330	12.993	380	14.961	430	16.929	480	18.898
281	11.083	331	13.032	381	15.000	431	16.969	481	18.937
282	11.107	332	13.071	382	15.040	432	17.008	482	18.977
283	11.14	333	13.110	383	15.079	433	17.047	483	19.016
284	11.181	334	13.149	384	15.118	434	17.087	484	19.056
285	11.221	335	13.188	385	15.158	435	17.126	485	19.095
286	11.260	336	13.228	386	15.197	436	17.166	486	19.134
287	11.291	337	13.266	387	15.236	437	17.205	487	19.174
288	11.339	338	13.307	388	15.276	438	17.244	488	19.213
289	11.378	339	13.347	389	15.315	439	17.284	489	19.252
290	11.417	340	13.386	390	15.354	440	17.323	490	19.292
291	11.457	341	13.425	391	15.394	441	17.362	491	19.331
292	11.44	342	13.465	392	15.433	442	17.402	492	19.370
293	11.536	343	13.504	393	15.473	443	17.441	493	19.410
294	11.575	344	13.543	394	15.512	444	17.480	494	19.449
295	11.614	345	13.583	395	15.551	445	17.520	495	19.488
296	11.654	346	13.622	396	15.591	446	17.559	496	19.528
297	11.693	347	13.662	397	15.630	447	17.598	497	19.567
298	11.732	348	13.701	398	15.669	448	17.638	498	19.606
299	11.772	349	13.740	399	15.709	449	17.677	499	19.646
300	11.811	350	13.780	400	15.748	450	17.717	500	19.685

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF MILLIMETRES IN INCHES.

Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches	Milli- metres	Inches
501	19.720	501	21.035	601	23.662	651	25.630	701	27.599
502	19.764	502	21.132	602	23.701	652	25.670	702	27.638
503	19.808	503	21.228	603	23.740	653	25.709	703	27.677
504	19.852	504	21.324	604	23.780	654	25.748	704	27.717
505	19.896	505	21.420	605	23.819	655	25.788	705	27.756
506	19.940	506	21.516	606	23.858	656	25.827	706	27.796
507	19.984	507	21.612	607	23.898	657	25.866	707	27.835
508	20.028	508	21.708	608	23.937	658	25.906	708	27.874
509	20.072	509	21.804	609	23.977	659	25.945	709	27.914
510	20.116	510	21.900	610	24.016	660	25.984	710	27.953
511	20.160	511	22.000	611	24.055	661	26.024	711	27.992
512	20.204	512	22.096	612	24.095	662	26.063	712	28.032
513	20.248	513	22.192	613	24.134	663	26.103	713	28.071
514	20.292	514	22.288	614	24.173	664	26.142	714	28.110
515	20.336	515	22.384	615	24.213	665	26.181	715	28.150
516	20.380	516	22.480	616	24.252	666	26.221	716	28.189
517	20.424	517	22.576	617	24.292	667	26.260	717	28.229
518	20.468	518	22.672	618	24.331	668	26.299	718	28.268
519	20.512	519	22.768	619	24.370	669	26.339	719	28.307
520	20.556	520	22.864	620	24.410	670	26.378	720	28.347
521	20.600	521	22.960	621	24.449	671	26.418	721	28.386
522	20.644	522	23.056	622	24.488	672	26.457	722	28.425
523	20.688	523	23.152	623	24.528	673	26.496	723	28.465
524	20.732	524	23.248	624	24.567	674	26.536	724	28.504
525	20.776	525	23.344	625	24.607	675	26.575	725	28.544
526	20.820	526	23.440	626	24.646	676	26.614	726	28.583
527	20.864	527	23.536	627	24.685	677	26.654	727	28.622
528	20.908	528	23.632	628	24.725	678	26.693	728	28.662
529	20.952	529	23.728	629	24.764	679	26.733	729	28.701
530	20.996	530	23.824	630	24.803	680	26.772	730	28.740
531	21.040	531	23.920	631	24.843	681	26.811	731	28.780
532	21.084	532	24.016	632	24.882	682	26.851	732	28.819
533	21.128	533	24.112	633	24.921	683	26.890	733	28.859
534	21.172	534	24.208	634	24.961	684	26.929	734	28.898
535	21.216	535	24.304	635	25.000	685	26.969	735	28.937
536	21.260	536	24.400	636	25.040	686	27.008	736	28.977
537	21.304	537	24.496	637	25.079	687	27.047	737	29.016
538	21.348	538	24.592	638	25.118	688	27.087	738	29.055
539	21.392	539	24.688	639	25.158	689	27.126	739	29.095
540	21.436	540	24.784	640	25.197	690	27.166	740	29.134
541	21.480	541	24.880	641	25.236	691	27.205	741	29.173
542	21.524	542	24.976	642	25.276	692	27.244	742	29.213
543	21.568	543	25.072	643	25.315	693	27.284	743	29.252
544	21.612	544	25.168	644	25.355	694	27.323	744	29.292
545	21.656	545	25.264	645	25.394	695	27.362	745	29.331
546	21.700	546	25.360	646	25.433	696	27.402	746	29.370
547	21.744	547	25.456	647	25.473	697	27.441	747	29.410
548	21.788	548	25.552	648	25.512	698	27.481	748	29.449
549	21.832	549	25.648	649	25.551	699	27.520	749	29.488
550	21.876	550	25.744	650	25.591	700	27.559	750	29.528

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF METRES IN FEET.

1 Metre = 3.280899 Feet.

Metres	0	1	2	3	4	5	6	7	8	9
1	5 2803	3 6040	5 9371	4 2652	4 5933	4 9213	5 2494	5 5775	5 9056	6 2337
2	6 5618	6 8859	7 2180	7 5461	7 8742	8 2022	8 5303	8 8584	9 1865	9 5146
3	8 8427	10 1708	10 4989	10 8270	11 1551	11 4831	11 8112	12 1393	12 4674	12 7955
4	13 1236	13 4517	13 7798	14 1079	14 4360	14 7640	15 0921	15 4202	15 7483	16 0764
5	16 4045	16 7326	17 0607	17 3888	17 7169	18 0449	18 3730	18 7011	19 0292	19 3573
6	19 6854	20 0135	20 3416	20 6697	20 9978	21 3258	21 6539	21 9820	22 3101	22 6382
7	22 9663	23 2944	23 6225	23 9506	24 2787	24 6067	24 9348	25 2629	25 5910	25 9191
8	26 2472	26 5753	26 9034	27 2315	27 5596	27 8876	28 2157	28 5438	28 8719	29 2000
9	29 5281	29 8562	30 1843	30 5124	30 8405	31 1685	31 4966	31 8247	32 1528	32 4809
10	32 8090	33 1371	33 4652	33 7933	34 1213	34 4494	34 7775	35 1056	35 4337	35 7618

EQUIVALENTS OF FEET IN METRES.

1 Foot = 3.047945 of 1 Metre.

Feet	0	1	2	3	4	5	6	7	8	9
1	30480	33547	36675	39623	42671	45719	48767	51815	54863	57911
2	60959	67097	67055	70103	73151	76199	79247	82294	85342	88390
3	91438	94486	97534	1 00582	1 03630	1 06678	1 09726	1 12774	1 15822	1 18870
4	1 21918	1 24966	1 28014	1 31062	1 34110	1 37158	1 40205	1 43253	1 46301	1 49349
5	1 52397	1 55445	1 58493	1 61541	1 64589	1 67637	1 70685	1 73733	1 76781	1 79829
6	1 82877	1 85925	1 88973	1 92020	1 95068	1 98116	2 01164	2 04212	2 07260	2 10308
7	2 13356	2 16404	2 19452	2 22500	2 25548	2 28596	2 31644	2 34692	2 37740	2 40788
8	2 43836	2 46884	2 49931	2 52979	2 56027	2 59075	2 62123	2 65171	2 68219	2 71267
9	2 74315	2 77363	2 80411	2 83459	2 86507	2 89555	2 92603	2 95651	2 98699	3 01747
10	3 04794	3 07842	3 10890	3 13938	3 16986	3 20034	3 23082	3 26130	3 29178	3 32226

EQUIVALENTS OF SQUARE CENTIMETRES IN SQUARE INCHES.

1 Square Centimetre = 1.550059 of 1 Square Inch.

Square Cent.	0	1	2	3	4	5	6	7	8	9
1	15501	17051	18601	20151	21701	23251	24801	26351	27901	29451
2	31001	32551	34101	35651	37201	38751	40301	41852	43402	44952
3	46502	48052	49602	51152	52702	54252	55802	57352	58902	60452
4	62002	63552	65102	66652	68203	69753	71303	72853	74403	75953
5	77503	79053	80603	82153	83703	85253	86803	88353	89903	91453
6	93004	94554	96104	97654	99204	1 00754	1 02304	1 03854	1 05404	1 06954
7	1 08504	1 10054	1 11604	1 13154	1 14704	1 16254	1 17804	1 19355	1 20905	1 22455
8	1 24005	1 25555	1 27105	1 28655	1 30205	1 31755	1 33305	1 34855	1 36405	1 37955
9	1 39505	1 41055	1 42605	1 44156	1 45706	1 47256	1 48806	1 50356	1 51906	1 53456
10	1 55006	1 56556	1 58106	1 59656	1 61206	1 62756	1 64306	1 65856	1 67406	1 68956

DORMAN, LONG & CO LIMITED

EQUIVALENTS OF SQUARE INCHES IN
SQUARE CENTIMETRES

1 Square Inch = 6.4516 Square Centimetres

Square Inches	0	1	2	3	4	5	6	7	8	9
1	6.4516	7.0667	7.6818	8.2969	8.9120	9.5271	10.1422	10.7573	11.3724	11.9875
2	12.9032	14.1334	15.3636	16.5937	17.8239	19.0540	20.2842	21.5143	22.7445	23.9746
3	19.3548	21.2050	23.0552	24.9054	26.7556	28.6057	30.4559	32.3061	34.1563	35.9864
4	25.8064	28.2666	30.7268	33.1870	35.6472	38.1074	40.5676	43.0278	45.4880	47.9482
5	32.2580	35.2182	38.1784	41.1386	44.0988	47.0590	50.0192	52.9794	55.9396	58.8998
6	38.7096	42.1698	45.1300	48.0902	51.0504	54.0106	56.9708	59.9310	62.8912	65.8514
7	45.1612	49.1214	53.0816	57.0418	61.0020	64.9622	68.9224	72.8826	76.8428	80.8030
8	51.6128	56.0730	60.5332	64.9934	69.4536	73.9138	78.3740	82.8342	87.2944	91.7546
9	58.0644	63.5246	68.9848	74.4450	79.9052	85.3654	90.8256	96.2858	101.7460	107.2062
10	64.5160	70.4762	76.4364	82.3966	88.3568	94.3170	100.2772	106.2374	112.1976	118.1578

EQUIVALENTS OF SQUARE METRES IN
SQUARE FEET

1 Square Metre = 10.7639 Square Feet

Square Metres	0	1	2	3	4	5	6	7	8	9
1	10.7639	11.6128	12.4617	13.3106	14.1595	15.0084	15.8573	16.7062	17.5551	18.4040
2	21.5278	23.2256	24.9234	26.6212	28.3190	30.0168	31.7146	33.4124	35.1102	36.8080
3	32.2917	35.3895	38.4873	41.5851	44.6829	47.7807	50.8785	53.9763	57.0741	60.1719
4	43.0556	47.1534	51.2512	55.3490	59.4468	63.5446	67.6424	71.7402	75.8380	79.9358
5	53.8195	58.9173	64.0151	69.1129	74.2107	79.3085	84.4063	89.5041	94.6019	99.7000
6	64.5834	70.6812	76.7790	82.8768	88.9746	95.0724	101.1702	107.2680	113.3658	119.4636
7	75.3473	82.4451	89.5429	96.6407	103.7385	110.8363	117.9341	125.0319	132.1297	139.2275
8	86.1112	94.2090	102.3068	110.4046	118.5024	126.6002	134.6980	142.7958	150.8936	158.9914
9	96.8751	105.9729	115.0707	124.1685	133.2663	142.3641	151.4619	160.5597	169.6575	178.7553
10	107.6390	118.7368	129.8346	140.9324	152.0302	163.1280	174.2258	185.3236	196.4214	207.5192

EQUIVALENTS OF SQUARE FEET IN
SQUARE METRES

1 Square Foot = 0.092903 Square Metres

Square Feet	0	1	2	3	4	5	6	7	8	9
1	0.0929	0.1858	0.2787	0.3716	0.4645	0.5574	0.6503	0.7432	0.8361	0.9290
2	0.1858	0.3716	0.5574	0.7432	0.9290	1.1148	1.3006	1.4864	1.6722	1.8580
3	0.2787	0.5574	0.8361	1.1148	1.3935	1.6722	1.9509	2.2296	2.5083	2.7870
4	0.3716	0.7432	1.1148	1.4864	1.8580	2.2296	2.6012	2.9728	3.3444	3.7160
5	0.4645	0.9290	1.3935	2.0380	2.4925	2.9470	3.4015	3.8560	4.3105	4.7650
6	0.5574	1.1148	1.6722	2.2296	2.7870	3.3444	3.9018	4.4592	5.0166	5.5740
7	0.6503	1.3006	1.9509	2.6012	3.2515	3.9018	4.5521	5.2024	5.8527	6.5030
8	0.7432	1.4864	2.2296	2.9728	3.7160	4.4592	5.2024	5.9456	6.6888	7.4320
9	0.8361	1.6722	2.4925	3.3128	4.1331	4.9534	5.7737	6.5940	7.4143	8.2346
10	0.9290	1.8580	2.7870	3.7160	4.6450	5.5740	6.5030	7.4320	8.3610	9.2900

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF CUBIC CENTIMETRES IN
CUBIC INCHES.

1 Cubic Centimetre = 0.06102705 of a Cubic Inch.

Cubic Cent.	0	1	2	3	4	5	6	7	8	9
1	061027	067130	073232	079335	085438	091541	097643	103746	109849	115951
2	122054	128157	134260	140362	146465	152568	158670	164773	170876	176978
3	183061	189164	195267	201369	207472	213575	219677	225780	231883	237985
4	244103	250206	256308	262411	268513	274616	280718	286821	292923	299026
5	305135	311238	317341	323443	329546	335649	341751	347854	353957	360060
6	366162	372265	378368	384470	390573	396676	402779	408881	414984	421087
7	427189	433292	439395	445497	451600	457703	463806	469908	476011	482114
8	488216	494319	500422	506525	512627	518730	524833	530935	537038	543141
9	549243	555346	561449	567552	573654	579757	585860	591962	598065	604168
10	610271	616373	622476	628579	634681	640784	646887	652989	659092	665195

EQUIVALENTS OF CUBIC INCHES IN CUBIC
CENTIMETRES.

1 Cubic Inch = 16.386176 Cubic Centimetres.

Cubic Ins.	0	1	2	3	4	5	6	7	8	9
1	16.386	16.550	16.713	16.877	17.040	17.204	17.367	17.530	17.694	17.857
2	32.772	33.100	33.428	33.756	34.084	34.412	34.740	35.068	35.396	35.724
3	49.158	50.150	51.142	52.134	53.126	54.118	55.110	56.102	57.094	58.086
4	65.545	67.183	68.821	70.459	72.097	73.735	75.373	77.011	78.649	80.287
5	81.931	83.569	85.207	86.845	88.483	90.121	91.759	93.397	95.035	96.673
6	98.317	99.956	101.594	103.233	104.872	106.510	108.149	109.787	111.426	113.065
7	114.703	116.342	117.980	119.619	121.258	122.896	124.535	126.174	127.812	129.451
8	131.089	132.728	134.367	136.005	137.644	139.282	140.921	142.560	144.198	145.837
9	147.476	149.114	150.753	152.391	154.030	155.669	157.307	158.946	160.585	162.223
10	163.862	165.500	167.139	168.778	170.416	172.055	173.693	175.332	176.971	178.609

EQUIVALENTS OF CUBIC METRES IN
CUBIC FEET.

1 Cubic Metre = 35.31658 Cubic Feet.

Cubic Metre	0	1	2	3	4	5	6	7	8	9
1	35.317	38.843	42.369	45.895	49.421	52.947	56.473	60.000	63.526	67.052
2	70.633	74.160	77.686	81.213	84.739	88.266	91.792	95.319	98.845	102.372
3	105.950	109.481	113.011	116.542	120.072	123.603	127.133	130.664	134.194	137.725
4	141.266	144.798	148.330	151.861	155.393	158.925	162.456	165.988	169.520	173.051
5	176.583	180.115	183.646	187.178	190.710	194.241	197.773	201.305	204.836	208.368
6	211.899	215.431	218.963	222.494	226.026	229.558	233.089	236.621	240.153	243.684
7	247.216	250.748	254.279	257.811	261.343	264.874	268.406	271.938	275.469	279.001
8	282.533	286.064	289.596	293.128	296.659	300.191	303.723	307.254	310.786	314.318
9	317.849	321.381	324.913	328.444	331.976	335.508	339.039	342.571	346.103	349.634
10	353.166	356.697	360.229	363.761	367.292	370.824	374.356	377.887	381.419	384.951

DORMAN, LONG & CO LIMITED

EQUIVALENTS OF CUBIC FEET IN
CUBIC METRES.

1 Cubic Foot = 0.0283168 Cubic Metres.

Cubic Feet	0	1	2	3	4	5	6	7	8	9
1	0.0283168	0.0285000	0.0286832	0.0288664	0.0290496	0.0292328	0.0294160	0.0295992	0.0297824	0.0299656
2	0.0566336	0.0568168	0.0570000	0.0571832	0.0573664	0.0575496	0.0577328	0.0579160	0.0580992	0.0582824
3	0.0849504	0.0851336	0.0853168	0.0855000	0.0856832	0.0858664	0.0860496	0.0862328	0.0864160	0.0865992
4	0.1132672	0.1134504	0.1136336	0.1138168	0.1140000	0.1141832	0.1143664	0.1145496	0.1147328	0.1149160
5	0.1415840	0.1417672	0.1419504	0.1421336	0.1423168	0.1425000	0.1426832	0.1428664	0.1430496	0.1432328
6	0.1699008	0.1700840	0.1702672	0.1704504	0.1706336	0.1708168	0.1710000	0.1711832	0.1713664	0.1715496
7	0.1982176	0.1984008	0.1985840	0.1987672	0.1989504	0.1991336	0.1993168	0.1995000	0.1996832	0.1998664
8	0.2265344	0.2267176	0.2269008	0.2270840	0.2272672	0.2274504	0.2276336	0.2278168	0.2280000	0.2281832
9	0.2548512	0.2550344	0.2552176	0.2554008	0.2555840	0.2557672	0.2559504	0.2561336	0.2563168	0.2565000
10	0.2831680	0.2833512	0.2835344	0.2837176	0.2839008	0.2840840	0.2842672	0.2844504	0.2846336	0.2848168

EQUIVALENTS OF KILOGRAMMES IN POUNDS

1 Kilogramme = 2.20462 Pounds.

Kilogramme	0	1	2	3	4	5	6	7	8	9
1	2.20462	2.42508	2.64554	2.86600	3.08646	3.30692	3.52738	3.74784	3.96830	4.18876
2	4.40924	4.62970	4.85016	5.07062	5.29108	5.51154	5.73200	5.95246	6.17292	6.39338
3	6.61386	6.83432	7.05478	7.27524	7.49570	7.71616	7.93662	8.15708	8.37754	8.59800
4	8.81856	9.03902	9.25948	9.47994	9.70040	9.92086	10.14132	10.36178	10.58224	10.80270
5	11.02318	11.24364	11.46410	11.68456	11.90502	12.12548	12.34594	12.56640	12.78686	13.00732
6	13.20794	13.42840	13.64886	13.86932	14.08978	14.31024	14.53070	14.75116	14.97162	15.19208
7	15.39264	15.61310	15.83356	16.05402	16.27448	16.49494	16.71540	16.93586	17.15632	17.37678
8	17.59724	17.81770	18.03816	18.25862	18.47908	18.69954	18.91999	19.14045	19.36091	19.58137
9	19.80183	20.02229	20.24275	20.46321	20.68367	20.90413	21.12459	21.34505	21.56551	21.78597
10	22.00643	22.22689	22.44735	22.66781	22.88827	23.10873	23.32919	23.54965	23.77011	23.99057

EQUIVALENTS OF POUNDS IN KILOGRAMMES.

1 Pound = 0.45359237 Kilogramme.

Pounds	0	1	2	3	4	5	6	7	8	9
1	0.45359	0.90718	1.36077	1.81436	2.26795	2.72154	3.17513	3.62872	4.08231	4.53590
2	0.90718	1.81436	2.72154	3.62872	4.53590	5.44308	6.35026	7.25744	8.16462	9.07180
3	1.36077	2.72154	4.08231	5.44308	6.80385	8.16462	9.52539	10.88616	12.24693	13.60770
4	1.81436	3.62872	5.44308	7.25744	9.07180	10.88616	12.70052	14.51488	16.32924	18.14360
5	2.26795	4.53590	6.80385	9.07180	11.33975	13.60770	15.87565	18.14360	20.41155	22.67950
6	2.72154	5.44308	8.16462	10.88616	13.60770	16.32924	19.05078	21.77232	24.49386	27.21540
7	3.17513	6.35026	9.52539	12.70052	15.87565	19.05078	22.22591	24.94745	27.66899	30.39053
8	3.62872	7.25744	10.88616	14.51488	18.14360	21.77232	24.94745	28.12358	30.84415	33.56607
9	4.08231	8.16462	12.24693	16.32924	19.91831	23.54965	27.17079	30.39053	33.56607	36.74161
10	4.53590	9.07180	13.60770	18.14360	21.77232	25.41155	29.28249	32.56244	35.73349	39.91713

DORMAN, LONG & CO. LIMITED.

EQUIVALENTS OF KILOGRAMMES PER SQUARE CENTIMETRE IN POUNDS PER SQUARE INCH.

1 Kilogramme per Square Centimetre = 14.2232 Pounds per Square Inch.

Kilogramme per Square Centimetre	0	1	2	3	4	5	6	7	8	9
1	14.223	16.645	17.767	18.490	19.012	21.334	22.757	24.179	25.601	27.023
2	28.446	29.268	31.290	32.712	34.135	35.557	36.979	38.402	39.824	41.246
3	42.668	44.091	45.513	46.935	48.358	49.780	51.202	52.624	54.047	55.469
4	56.891	58.314	59.736	61.158	62.580	64.003	65.425	66.847	68.270	69.692
5	71.114	72.536	73.959	75.381	76.803	78.226	79.648	81.070	82.492	83.915
6	85.337	86.759	88.181	89.604	91.026	92.448	93.871	95.293	96.715	98.137
7	99.560	100.982	102.404	103.827	105.249	106.671	108.093	109.516	110.938	112.360
8	113.783	115.205	116.627	118.049	119.472	120.894	122.316	123.739	125.161	126.583
9	128.005	129.428	130.850	132.272	133.695	135.117	136.539	137.961	139.384	140.806
10	142.228	143.650	145.073	146.495	147.917	149.340	150.762	152.184	153.606	155.029

EQUIVALENTS OF POUNDS PER SQUARE INCH IN KILOGRAMMES PER SQUARE CENTIMETRE.

1 Pound per Square Inch = 0.030964 of a Kilogramme per Square Centimetre.

Pounds	0	1	2	3	4	5	6	7	8	9
1	0.070310	0.077340	0.084371	0.091402	0.098433	0.105464	0.112495	0.119526	0.126557	0.133588
2	0.140619	0.147650	0.154681	0.161712	0.168743	0.175774	0.182805	0.189836	0.196867	0.203898
3	0.210929	0.217960	0.224991	0.232021	0.239052	0.246083	0.253114	0.260145	0.267176	0.274207
4	0.281238	0.288269	0.295300	0.302331	0.309362	0.316393	0.323424	0.330455	0.337486	0.344517
5	0.351548	0.358579	0.365610	0.372641	0.379672	0.386702	0.393733	0.400764	0.407795	0.414826
6	0.421857	0.428888	0.435919	0.442950	0.449981	0.457012	0.464043	0.471074	0.478105	0.485136
7	0.492167	0.499198	0.506229	0.513260	0.520291	0.527322	0.534353	0.541384	0.548414	0.555445
8	0.562476	0.569507	0.576538	0.583569	0.590600	0.597631	0.604662	0.611693	0.618724	0.625755
9	0.632786	0.639817	0.646848	0.653879	0.660910	0.667941	0.674972	0.682003	0.689033	0.696064
10	0.703095	0.710126	0.717157	0.724188	0.731219	0.738250	0.745281	0.752312	0.759343	0.766374

EQUIVALENTS OF KILOGRAMMES PER METRE IN POUNDS PER FOOT.

Kilo- grammes per Metre	0	1	2	3	4	5	6	7	8	9
1	6.720	7.392	8.063	8.735	9.407	1.0079	1.0751	1.1423	1.2095	1.2767
2	1.3439	1.4111	1.4783	1.5455	1.6127	1.6799	1.7471	1.8143	1.8815	1.9487
3	2.0159	2.0831	2.1503	2.2175	2.2847	2.3518	2.4190	2.4862	2.5534	2.6206
4	2.6878	2.7550	2.8222	2.8894	2.9566	3.0238	3.0910	3.1582	3.2254	3.2926
5	3.3598	3.4270	3.4942	3.5614	3.6286	3.6958	3.7630	3.8302	3.8973	3.9645
6	4.0317	4.0989	4.1661	4.2333	4.3005	4.3677	4.4349	4.5021	4.5693	4.6365
7	4.7037	4.7709	4.8381	4.9053	4.9725	5.0397	5.1069	5.1741	5.2413	5.3085
8	5.3757	5.4428	5.5100	5.5772	5.6444	5.7116	5.7788	5.8460	5.9132	5.9804
9	6.0476	6.1148	6.1820	6.2492	6.3164	6.3836	6.4508	6.5180	6.5852	6.6524
10	6.7196	6.7868	6.8540	6.9212	6.9883	7.0555	7.1227	7.1899	7.2571	7.3243

DORMAN, LIND & CO. LIMITED

EQUIVALENTS OF POUNDS PER FOOT IN KILOGRAMMES PER METRE

Pounds per Foot	1	2	3	4	5	6	7	8	9	10
Kilogrammes per Metre	1.488	2.976	4.464	5.952	7.440	8.928	10.416	11.904	13.392	14.880
1 Kilogramme per Metre	0.675	1.350	2.025	2.700	3.375	4.050	4.725	5.400	6.075	6.750
10 Kilogrammes per Metre	6.750	13.500	20.250	27.000	33.750	40.500	47.250	54.000	60.750	67.500

EQUIVALENTS OF MOMENTS OF INERTIA AND SECTION MODULI.

Moment of Inertia in inch ⁴ (I)	Moment of Inertia in cm ⁴ (I)
Section Modulus in inch ³ (S)	Section Modulus in cm ³ (S)

CONTRACTIONS GENERALLY ADOPTED

Linear Measure	Area Measure	Volume Measure	Weight
Length (Feet)	Area (Square Feet)	Volume (Cubic Feet)	Weight (Pounds)
1 Foot	144 Square Inches	1728 Cubic Inches	16 Pounds
1 Yard	9 Square Feet	27 Cubic Feet	256 Pounds
1 Rod	30.25 Square Feet	172.8 Cubic Feet	2812 Pounds
1 Pole	156.25 Square Feet	864 Cubic Feet	13872 Pounds
1 Fathom	36 Square Feet	423.36 Cubic Feet	6771 Pounds
1 Chain	625 Square Feet	125 Cubic Feet	20000 Pounds
1 Link	1.37 Square Feet	0.0676 Cubic Feet	1.07 Pounds

These Units are used for all measurements and are subject to the
weight of steel.

The International Standard for Steel is used for all measurements and
all other units are subject to the weight of steel.

DORMAN, LONG & CO. LIMITED,

COMPARISON OF WEIGHTS OF STEEL PLATES
TO 1 INCH THICK.

Divided into 32nds and 40ths of an Inch, and Millimetres.

Milli- metres	Weight in lbs. per sq. foot	32nds	16ths	20ths	40ths	Weight in lbs. per sq. foot	Milli- metres
25	40.80	32	16	20	40	40.80	25
	39.525	31			39	39.78	
24	38.25	30	15	19	38	38.76	24
					37	37.74	
23	36.975	29		18	36	36.72	23
					35	35.70	
22	35.70	28	14		34	34.68	22
	34.425	27		17	33	33.66	
21	33.15	26	13		32	32.64	21
				16	31	31.62	
20	31.875	25			30	30.60	20
					29	29.58	
19	30.60	24	12	15	28	28.56	19
					27	27.54	
18	29.325	23		14	26	26.52	18
	28.05	22	11		25	25.50	
17	26.775	21		13	24	24.48	17
					23	23.46	
16	25.50	20	10	12	22	22.44	16
					21	21.42	
15	24.225	19			20	20.40	15
					19	19.38	
14	22.95	18	9	11	18	18.36	14
	21.675	17			17	17.34	
13	20.40	16	8	10	16	16.32	13
					15	15.30	
12	19.125	15			14	14.28	12
					13	13.26	
11	17.85	14	7	9	12	12.24	11
	16.575	13		8	11	11.22	
10	15.30	12	6		10	10.20	10
					9	9.18	
9	14.025	11		7	8	8.16	9
					7	7.14	
8	12.75	10	5	6	6	6.12	8
					5	5.10	
7	11.475	9			4	4.08	7
	10.20	8	4	5	3	3.06	
6	8.925	7			2	2.04	6
					1	1.02	
5	7.65	6	3	4			5
4	6.375	5		3			4
3	5.10	4	2				3
2	3.825	3		2			2
1	2.55	2	1	1			1
	1.275	1					

DORMAN, LONG & CO. LIMITED.

Beams, connections for	96-107
" " " notes on	65, 99
" dimensions and properties	33-35
" deflection, bending moment and shear	44, 45, 180-185
" distance pieces for	106-107
" fishplates for	104-105
" general formulae for flexure of	180
" minimum spans for standard cleats	100-103
" notes on	44, 45
" properties and dimensions of	33-35
Beams, reference marks	3-13, 34
" safe loads on	46-47
" sections of	3-13
" separators for	106-107
" standard spacing of holes in flanges of	35-108
" systems of loading	181-185
" unsymmetrically loaded	181-185
" weight of	3-13, 34
" with cast iron separators	106-107
Bearing, load, shearing value of rivets	191
Bending moment, shear and deflection of beams	181-185
Bilbois, steel	178
Bismars, steel	178
Bobbin, sections	31
Bolts and Nuts, sizes of Whitworth	198
" weight of Whitworth	199
" galvanized, size and weight	163
Bolts, hook, size and weight	163
" Lewis	200
Brands of Sheet-iron	153
" Wire	167
Breaking strain of steel wire	171
Brickwork, weight of	233
Bridges, troughing for	135-139
" illustrations of troughing	135-149
Bridge Rails, sections of	29
British and metric equivalents	238-251
Bulb Angles, dimensions and properties	21, 22, 42, 43
" " reference marks	21, 22, 42
" " sections of	21-22
" " weight per foot	21, 22, 42

DORMAN, LONG & CO. LIMITED.

Bulb. True dimensions and properties	20, 42, 41
" " reference marks	28, 42
" " sections of	21
" " weight per foot	28, 40
Bulk and weight of water	253

C

Capacity, measure of, British	235
" " " metric	237
" " " British and metric equivalents	236
Cast Iron, weight of	251
Cast Iron Separators, or distance pieces	31, 100, 177
Centre of Gravity of Sections, position of, see "Dimensions and properties"	
Channels, centre line of flange of	118
" " compounds	6045
" " dimensions	14, 17, 91
" " properties	51
" " reference marks	53, 57, 90
" " sections of	14, 17
" " slanghons	1040
" " weight per foot	14, 17, 91
Circle, area of, table adjoining by 1/2	106, 507
" " small	100
" " circumference of, tables	503, 509
Cleats, standard angle	99, 105
Coal, weight of	255
Co-efficients for Beams, deflection	44, 63
" " length of members of roof trusses	116-117
" " stress of	116-117
Coke, weight of	255
Compounds, dimensions and properties of	25, 61
" " notes on	44, 45
" " reference marks of	45, 63
" " riveting of (see also tables)	45
" " safe loads	40, 63
" " weights per foot	44, 45, 58, 59, 63
Concrete, weight of	255
Connectors for Beams, standard cleats	99, 105
" " " distance pieces	30, 106, 107

DORMAN, LONG & CO. LIMITED.

Connections for Beams, standard fishplates	104, 105
" notes on	65, 99
" separators	99, 106, 107
" to stanchions	96-98
Contractions, generally adopted in metric system	251
Conversion Tables, lbs. into qrs., cwts. or decimals of a ton	230-232
" tons into lbs	232
" British into metric units	238-251
" metric into British units	238-251
Corrugated Sheetting, see "sheeting"	
Cosine of an Angle	187
Cosines, table of natural	226-227
Cotangent of an Angle	187
" table of natural	228-229
Crippling Loads for various values of $\frac{l}{r}$	69
Cubes, cube roots, squares and square roots of Nos. 1-1,000	214-223
Cubes of numbers and fractional parts	212-213
Cubic measure, British	234
" equivalents, British and metric	238, 248, 249
" metric	236
Curtailment of flange plates in plate girders	110

D

Decimal equivalents of fractions of an inch	204
" of a foot for each $\frac{1}{4}$ of an inch	202-203
" of a ton, lbs., qrs. and cwts. expressed as	230-232
Deflection	44, 180-183
" bending moment and shear of beams	181-183
" coefficients	45, 47-63
Details for roof principals	118-120
Dimensions and Properties, notes on	33, 44
" of angles, bulb	42, 43
" " equal	40
" " unequal	38-39
" of I Beams	34, 35, 44
" " channels	36-37
" " compounds	44-61
" " stanchions	64, 65, 70-83

DORMAN, LONG & CO. LIMITED.

G

Galvanized Corrugated Sheets see " sheets	
Downpipes, &c	160, 161
Fittings	163
Gutters, &c	160, 161
Louvre Blades, Ridges	162
Washers	163
Wire	168-170
Gas Tubing, approximate weight and sizes	200
as distance pieces or separators	105
Gauge, imperial standard wire	171
Girders I Beam, dimensions and properties	33-35
notes on	44, 45
safe loads	46, 47
weight per foot	3-13, 34
compound, dimensions and properties	44-61
notes on	44, 45
safe loads	50-63
weight of	44, 49, 53, 57-61
plate, notes on	109, 110
safe loads on	111-114
Glass, weight of	233
Grillage for Stanchions	66
Gutters, Downpipes, &c	160, 161
Gyration, radii of	33-43

H

Half-rounds, hollow and solid	31
Handrails and Standards, types of	140
Hatch Bar Section	31
Holes, standard spacing in angles, beams and channels	108
Hook Bolts, galvanized, weight, &c	163

I

I Beams, see " Beams	
Imperial Standard Wire Gauge	171
Inch, decimal equivalents of fractions of	204
of a foot for each $\frac{1}{16}$ of an	202, 203

DORMAN, LONG & CO. LIMITED.

Inches into Millimetres	290
Inertia, moment of rectangles	153, 190
" " various sections	205
Ingot, steel size, shape and weight of	177
Iron, cast weight of	233

K

Kilogrammes into pounds	249
" per metre into pounds per foot	251

L

Lead, weight of	253
Length of flange plates in plate girders	116
Lewis Bolts size and weight	200
Linear Measure British	234
" equivalent L. British and metric	238, 243-244
" metric	250
Loading on Beams various systems of	180-185
Loads, gripping, for various values of $\frac{l}{r}$	76
Loads on floor, approximate live	255
Loads, see " safe loads	
Logarithms of Numbers from 1 to 1,000	204, 222
Louvre Blades	162

M

Masonry, weight of	203
Materials mode of ordering	"
" weight of various	233
Measures and Weights British	234, 235
" equivalent of British and metric units	239-251
" metric	256, 257
Mensuration	186
Metres into Feet	246
Metric equivalents of British units	235-251
" Moment of Inertia and Section Modulus	250

DORMAN, LONG & CO. LIMITED.

Metric measures	236, 237
contractions generally adopted	251
Millimetres into Inches	242
Minor Axis	33, 38, 39, 40, 42
Miscellaneous Compound Measures	239
Sections	31
Substances, weight of	233
Mode of ordering Material	2
Modulus of Elasticity	180
Section (see also tables of properties)	180
equivalents in metric system	251
Moment of Inertia (see also tables of properties)	180
equivalents in metric system	251
of rectangles	188-190
of various sections	205

N

Nails, galvanized for sheeting	163
Natural Sines and Cosines	226, 227
Tangents and Cotangents	228, 229
Notes on I Beams and Compounds	44, 45
Connections	99
Dimensions and Properties	33
Plate Girders	109, 110
Roofs	115
Sections	1, 2
Stanchions and Struts	64-68
Troughing	121, 122
Numbers, logarithms of	224, 225
square, cubes, square and cube roots of	214-223
and fractional parts, cubes of	212, 213
" squares of	210, 211
Nuts and Bolts, galvanized, weight of	163
Nut Steel, sections of	31

P

Plate Girders, notes on	109, 110
safe loads on	111-114
Pounds into cwt., qrs., and decimals of a ton	230-232
" kilogrammes	249

DORMAN, LONG & CO. LIMITED.

Pounds per foot into kilogrammes per metre	251
tons into	252
Pressure of Wind on Roofs	115
Principals, roof	115-120
Profiles of Sections	3-32
change of	32
Properties and Dimensions, notes on	33
of angles, bulb	42, 43
equal and unequal	32-40
of I beams	33-35
channels	36, 37
compounds	44-61
stanchions	65, 70-83
Tees	41
bulb	42, 43
troughing	123-132, 134
zeds	36, 37
Purlins, connections to principals	120
see notes on roofs	115

R

Radius of Gyration	180
of various sections	53-43
see notes on properties	33
Rails, bridge	29
flat-bottomed	29
Reference Marks, notes on	1
see sections tables, &c.	
Ridges, galvanized	162
Rivet Bars, sections	31
Rivets, cupheaded, weight of	201
galvanized, weight of	163
heads, weight of	201
shearing and bearing value of	191
spacing of holes for, in angles, beams, and channels	108
Rivetting of Compounds (see also tables)	45
Roofs, loads on	115
notes on	115
pressure of wind on	115
proportions of	115
weight of, approximate	115

DORMAN, LONG & CO. LIMITED.

Roof Trusses coefficients for length of members of	116, 117
" " " stress in members of	116, 117
" details of	118-120
" proportions of	115-117
Roots square and cube of numbers 1 to 1,000	214-223
Rope wire, plough steel and Bright's patent	167, 168
" " steel wire	175
Round steels	30
weight per foot of	198

S

Stanchions or angles as struts	88-90
" " " I Beams	46, 47
" " " compound	50-63
" " " plate girders	111-114
" " " stanchions	70-83
" " " struts, angle	85-90
" " " webs as struts	84
" " " troughing	122, 133, 134
Screws galvanized	163
Section Modulus	180
" see also " properties of sections"	
" British and metric equivalents	251
Sections angles bulb	21, 22
" " equal	20
" " unequal	18, 19
" I Beams	3-13
" channels	14-17
" flat bars	30
" hollow and solid half-rounds	31
" marked with an asterisk	1
" miscellaneous	31
" moment of inertia of various	205
" notes on	1, 2
" nut steel	31
" profile of, when rolled of, thicknesses other than standard	32
" properties of	33-43
" rails, bridge and flat bottomed	29
" rivet bars	31

DORMAN, LONG & CO. LIMITED.

Sections, rounds	30
squares	30
Sections of Tees	24-25
bulb	28
troughing	26-27
built up	23-24
zeds	23
Separators, standard C I	29-107
I beams with	106
Shear, bending moment and deflection of beams	121-133
Shearing and Bearing Value of Rivets	191
Sheets, brands	153
corrugated, gauge and size of corrugations	156-159
curved	159
galvanized approximate number per foot	154, 165
fittings for	165
Sines, table of natural	226-227
see also trigonometrical functions	227
Slabs, sizes of steel	172
Solution of Triangles	107
Spacing of Holes in Angles, Beams, and Channels	104
Splice Plates for beams	104-105
Square Measure, British	235
and metric equivalents	235-246, 247
metric	236
Squares, cubes, square and cube roots of Nos. 1 to 1,000	214-223
of numbers and fractional parts	210-211
sizes	30
weight per foot of	198
Stanchions, bases and caps for	65, 91-94
I Beams	70-73
brackets on	65, 96-98
channel	100-103
connections of I beams and compounds to	65, 96-98
compounds	72-83
crippling load for various values of $\frac{l}{r}$	69
dimensions and properties	65-82
grillages	76-68
joint plates for	65-86
limiting lengths for tabular load	64

DORMAN, LONG & CO. LIMITED.

Stanchions: notes on	64-68
" properties	70-82
" safe loads on	64, 71-83
" splice plates for	65, 96
" tabular weights	65
" zcd	78, 79
Steel: weight of	2, 233
" flat rolled	194-197
" wire	167-173
" " breaking strain of	171
" " table of tensile strain of	171-173
Strain of Wire: breaking	171
" " table of tensile	171-173
Stresses in Members of Roof Trusses	116, 117
Struts: notes on	64, 65
" crippling load for various values of $\frac{l}{r}$	69
" safe loads on	84-90
Substances: approximate weight of various	233
Surveying Measure	234
Systems of Loading, bending moment, shear and deflection for various	181-185

T

Tangent of an Angle	187
table of natural	228, 229
Tees, as struts	84
" bulb, see "bulb tees"	
" dimensions and properties	24, 25, 41
" reference marks	24, 25, 41
" sections of	24, 25
" bulb	28
" weights per foot	41
Thickness, variation from published	2
Template Bars, taper edges	178
Ton, cwt., qrs., lbs. as decimals of a	230-232
" into lbs.	232
Triangle, solution of	187
Trigonometrical functions	187

DORMAN, LONG & CO. LIMITED.

Troughing, application of built-up	135-139
" bridges, handrails for	140
" " types	141-149
built-up, calculation of suitable	135-139
" " diagrams of	123-131
" " dimensions and properties of	122-134
" " safe loads	122, 133, 134
" notes on	121, 122
" section of single	26, 27
" " built-up	123-131
Trusses, see "roofs"	
Tubing, gas, as distance pieces or separators	106
" " size and weight of	200

U

Unsymmetrically Loaded Beams	121-124
------------------------------	---------

V

Values, crippling loads for various $\frac{l}{r}$	69
" shearing and bearing, of rivets	191
Variation from published weights and thicknesses	32

W

Washers, bevelled and ordinary, sizes and weights	200
" galvanized, weight of	163
Water, weight and bulk of fresh	233
" " " sea	233
Weight, variation from published	32
Weights and Measures, British	234, 235
" " equivalents, British and metric	232-251
" " metric	236, 237
Weight of Angles, bulb	21, 22, 42
" " equal	40, 192, 193
" " unequal	38, 39, 192, 193

DOHMAN, LONG & CO. LIMITED.

Weight of pads	25.76
Wheel, weight of	225
Whitworth Bars and Nuts, standard sizes	136
— weight of —	150
Wink, pressure on rods	115
Wire, turn bending	150
— bridge	87
— connecting rod of	111
— drawing	180, 110
— pressure	185, 110
— gauge, standard connection	111
— guide	50
— rope	150
— separation	100
— telegraph and telephone	150
— turntable drive off	171, 175
— weight of	150, 11

Z

Zink, dimensions and properties	25, 50, 10
— reference mark	25, 40
— surface	30
— standard dimensions, properties and safe load— weight per foot	75, 75 25, 40
Zigzag lines in tables (see note on alterations)	81











